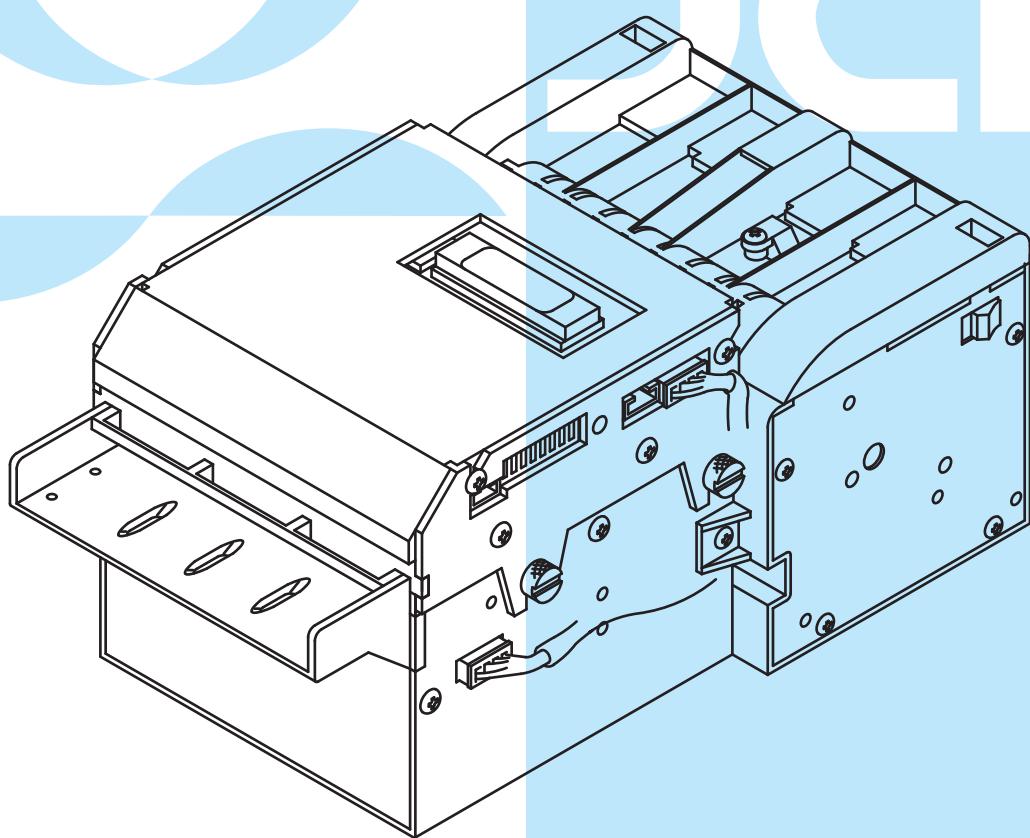


EBA-2X-PBX

Service Manual



Issue: 02/2007



JAPAN CASH MACHINE CO., LTD.

Preface

Thank you for purchasing JCM's EBA-2X-PBX Bill Acceptor. Please be sure to read the following and any related documents thoroughly to understand the correct operation and features of this unit.

Note

1. It is forbidden to copy the contents of this manual, in whole or in part, except for the user's personal use, without the express permission of Japan Cash Machine Co., Ltd.
2. The information provided in this manual is subject to change without notice.
3. This manual has been written with care and attention to detail; however, should you find any errors or omissions, please contact Japan Cash machine Co., Ltd. and inform them of your findings.
4. Please be aware that Japan Cash Machine shall not be held liable by the user for any damages, losses or third party claims arising from any uses of this product.
5. All Company/Manufacturer names used in this manual are the registered trademarks of those companies.

Precautions

■ Host Machine Design

- We take all possible measures to ensure the quality of this unit. However, performance degradation or possible short or open circuit faults could occur at the end of a product's life. Please ensure enough safety by the consideration of fail-safe design.
- Please allow sufficient space around the validator to facilitate removal of the unit or collection of bill.

■ Mounting

- Do not obstruct the acceptor's air holes so that the unit may be cooled.
- Do not use the acceptor at the place where the temperature variation fluctuates widely.
- Do not use the acceptor in direct sunlight or incandescent lighting (15-degree or less, 3000Lx or more).
- Do not use/store the acceptor in a dusty area.
- The acceptor is for indoor use only. Do not use the acceptor outside.
- Do not use the acceptor in a place where chemical vapor is present.
- When using the acceptor in a place where the air is subject to the car exhaust emission or cigarette smoke, please clean and maintain the acceptor at regular intervals.

■ Wiring

- When installing the EBA-2X-PBX unit or wiring the harness, be sure the power harness is unplugged from the power terminal to avoid unit damage.
- When wiring the harness to EBA-2X-PBX unit, please use in the specified power range and pin assignment. If not, it may cause unit damage.
- Be sure to connect the power harness properly. If not, incorrectly-input/output may occur by contact failure.
- Do not give the power harness a strong pull, otherwise the power harness will break.

■ Operation

- Do not modify the EBA-2X-PBX unit. Doing so may damage the unit.
- High impact to the EBA-2X-PBX unit or dropping unit may damage to the unit.
- Do not wipe the EBA-2X-PBX unit or the inside with thinner or organic solvent.
- Do not add moisture or liquid to the EBA-2X-PBX unit.
- Do not use the acceptor out of the operation Temperature/Humidity range.
- The following bills might be not accepted by EBA-2X-PBX unit properly or cause bill jam or unit damage.
 - a. Bills with stain, wear, wetness, tear or excessive wrinkles.
 - b. Dog-eared bills
 - c. Bills with incorrect cut dimensions or printing displacement
 - d. Bills with smear of oil or foreign object

■ Disposal

- When this unit is disposed off, it should be done so according to your country's regulations for similar types of industrial waste.

Product Configurations

EBA-2X-PBX's product configurations are as follows.

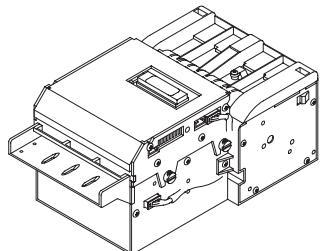
[Model] EBA - 22 - PB2 [Type] ***(*) - * * * - ***
 A B C D E F G

A: Acceptor Type	1 (The maximum accepting bill width is 79mm.) 2 (The maximum accepting bill width is 85mm.)
B: PB Unit Type	- (none): for EBA-21 unit 2: for EBA-22 unit
C: Country Code	ISO 3 digits Country Code
D: Bill Outlet direction	Type1: Rear guide B (Vertical type) Type2: Rear guide A (Downward Type) Type3: Without rear guide (Horizontal Type)
E: Faceplate Type	0: Without Faceplate
F: Guide Block Type	1: No guide block (EBA-21: 78mm, EBA-22: 85mm) 2: Type 2 (EBA-21: 68mm, EBA-22: 75mm) 3: Type 3 (EBA-21: ~72mm, EBA-22: 70/80mm) 4: Type 4 (EBA-21: 60/71/78mm, EBA-22: 68/78/85mm) 5: Type 5 (EBA-21: 67/78mm, EBA-22: 75/85mm)
G: Interface	0A2: ID-0A2 (Parallel/Pulse Interface) 003: ID-003 (Serial Interface) 0E3: ID-0E3 (CC-Talk Interface) 082A: ID-082A (Parallel/Pulse Interface)

Package Contents

EBA-2X-PBX unit's packaging contains the items listed below.

■EBA-2X-PBX unit



- This unit has been carefully packed, with special attention to quality. However if you find anything damaged or missing, please contact your local distributor immediately.

RoHS Compliance

The EBA-2X-PBX is a RoHS Compliant products. The following six kind of hazardous substances restricted by RoHS are NOT contained in the EBA-2X-PBX unit.

■ Restricted Hazardous Substances

- Plumbum
- Mercury
- Cadmium
- Chromium Hexavalent
- PBB
- PBDE

Documentation Conventions

The list below describes the documentation conventions used in this manual.

Icon/Mark	Descriptions
	This icon indicates important information or procedures that must be followed for correct and risk-free unit operation.
	This icon indicates useful or recommended supplemental information.
1. 2....	This indicates steps in a procedure. Be sure to perform these steps in the order given.
<u>See=></u>	This indicates related information to refer.
*	This indicates useful or important supplemental information



- All brand names and product names are trademarks or registered trademarks of their respective companies.

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1 Chapter

Introduction

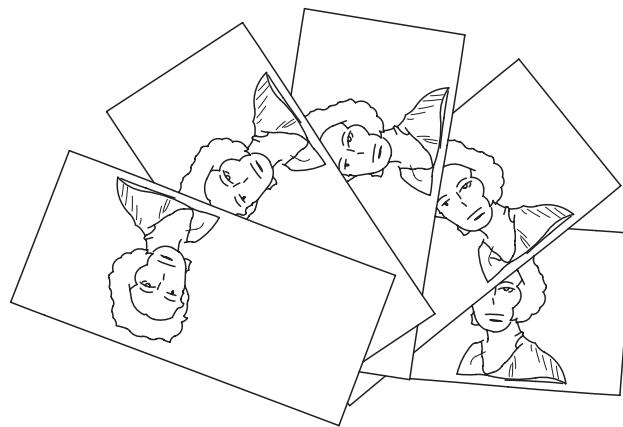
- 1-1. Main Features
- 1-2. Prior to Use
- 1-3. Parts Name
- 1-4. System Configuration
- 1-5. Operation Flow Chart

1-1. Main Features

In this section, EBA-2X-PBX unit's main features are explained.

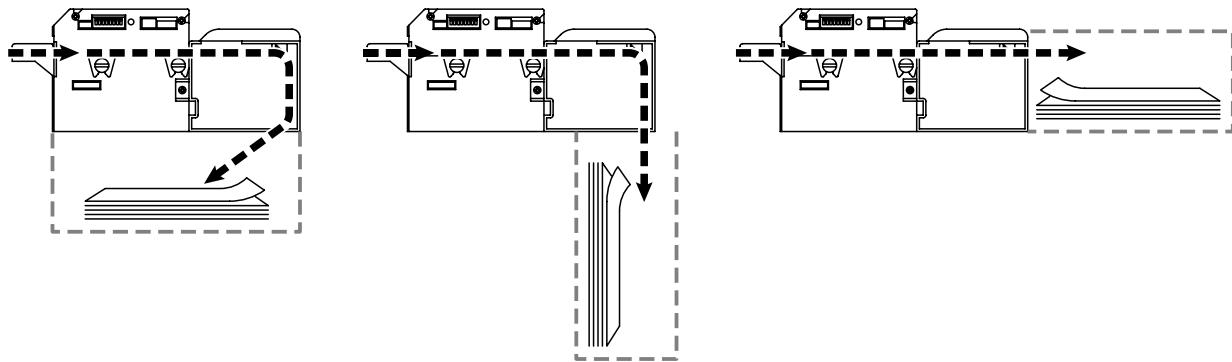
■ Setting for Accepting Bills

You can use the DIP Switch to make individual settings for the acceptance or rejection of specific bills.



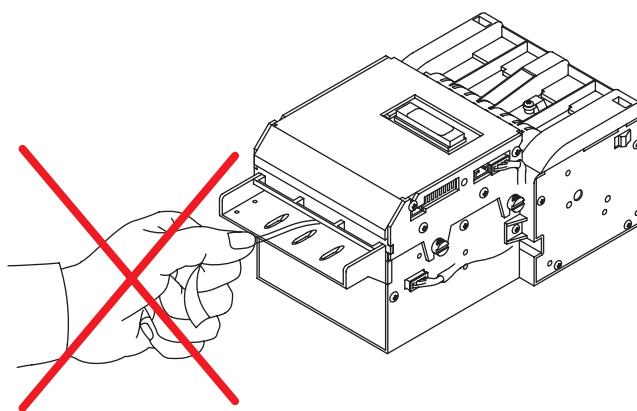
■ Allows Selection of the bill collection direction

You can select one of three directions in which the bills will be ejected for bill collection in accordance with the conditions of the installation site.



■ Picking Prevention Mechanism

A Security device is installed to prevent any illegal action. Once a bill is fed into the unit, it cannot be pulled out.



1-2. Prior to Use

Be sure to follow these steps when creating the project for EBA-2X-PBX unit.

1. Preparation

Before using EBA-2X-PBX unit, check the all required hardware is present and read all specification, wiring, and installation information.

See => Chapter 2 Specification or Chapter 3 Installation/Operation

3. Setting

Set the DIP switch depending on the connected host machine or the features of EBA-2X-PBX unit you want to use.

See => 2-5. DIP Switch Setting

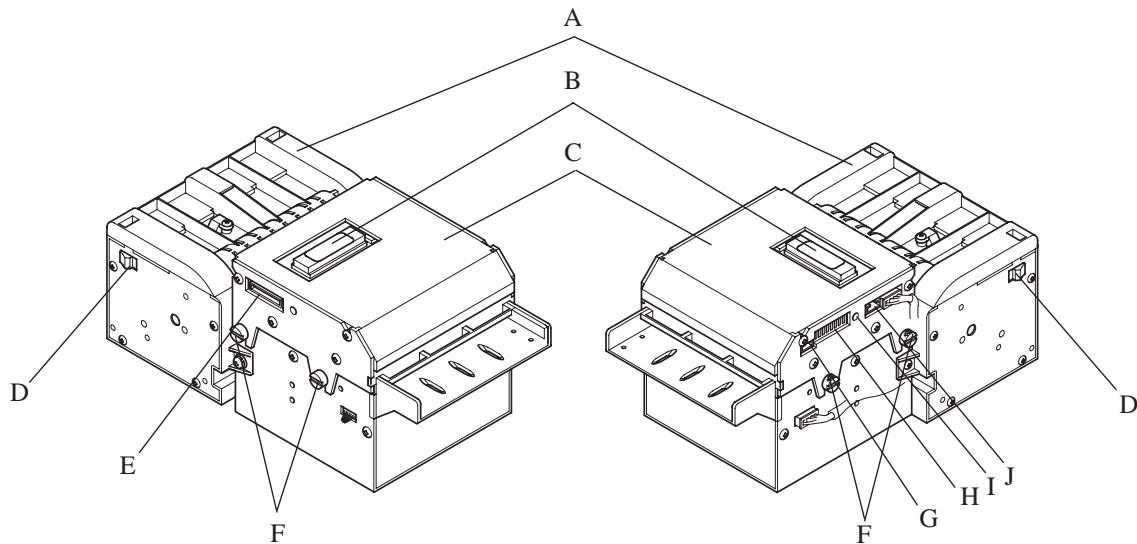
4. Installation

Install the EBA-2X-PBX unit and connect the harness with the host machine.

See => Chapter 2 Specifications, or Chapter 3 Installation/Operation

5. Operation

Supply the power to the EBA-2X-PBX unit.

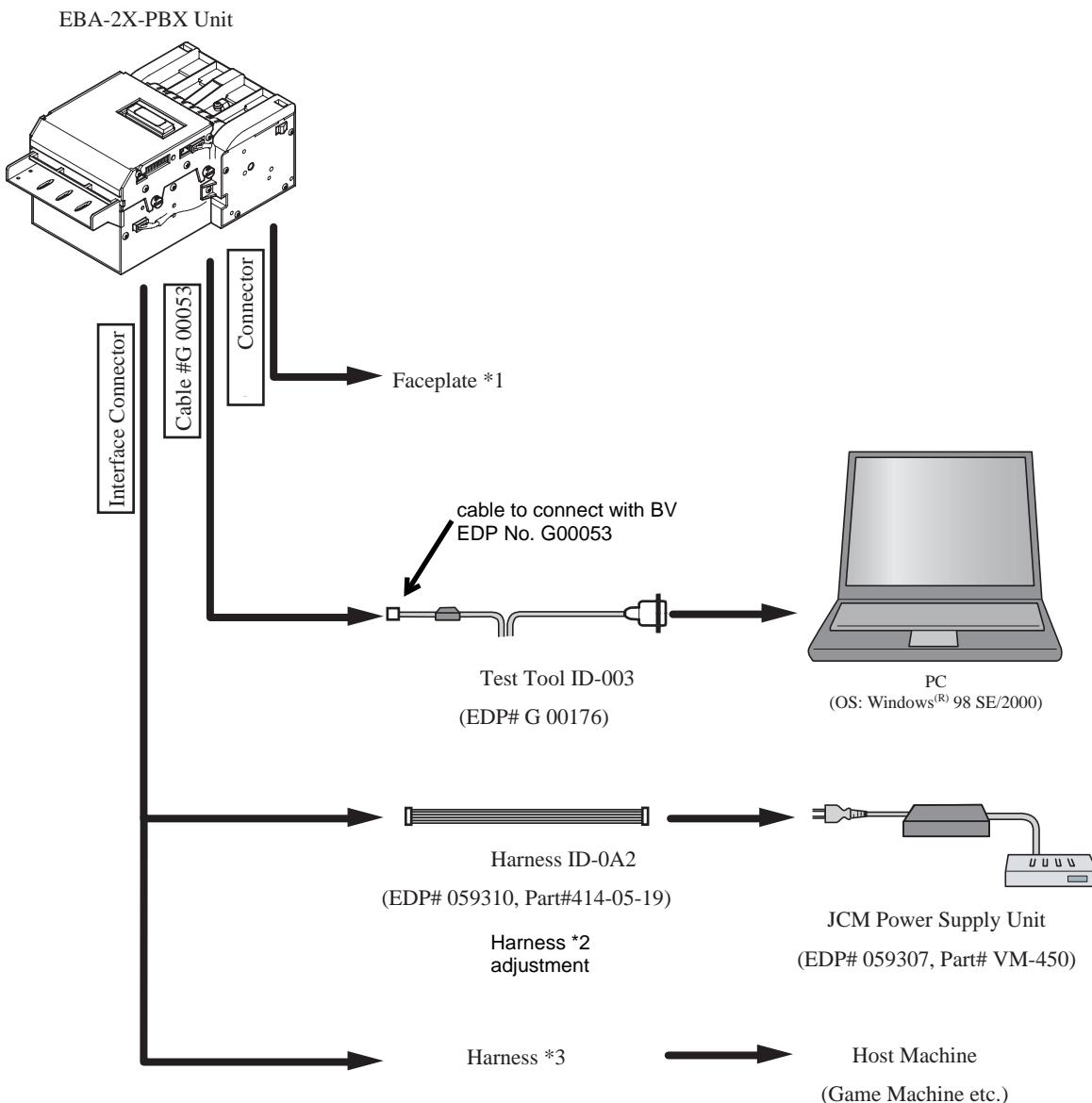
1-3. Parts Name

- A. PB Unit
- C. Acceptor Head
- E. Interface Connector
- G. CN5 Connector
- I. Diagnostic LED

- B. EEPROM
- D. PB Unit Release Slide Switch
- F. Acceptor Head Release Knobs
- H. DIP Switch
- J. CN4 Connector

1-4. System Configuration

The following diagram represents the standard items can be connected to the EBA-2X-PBX unit.



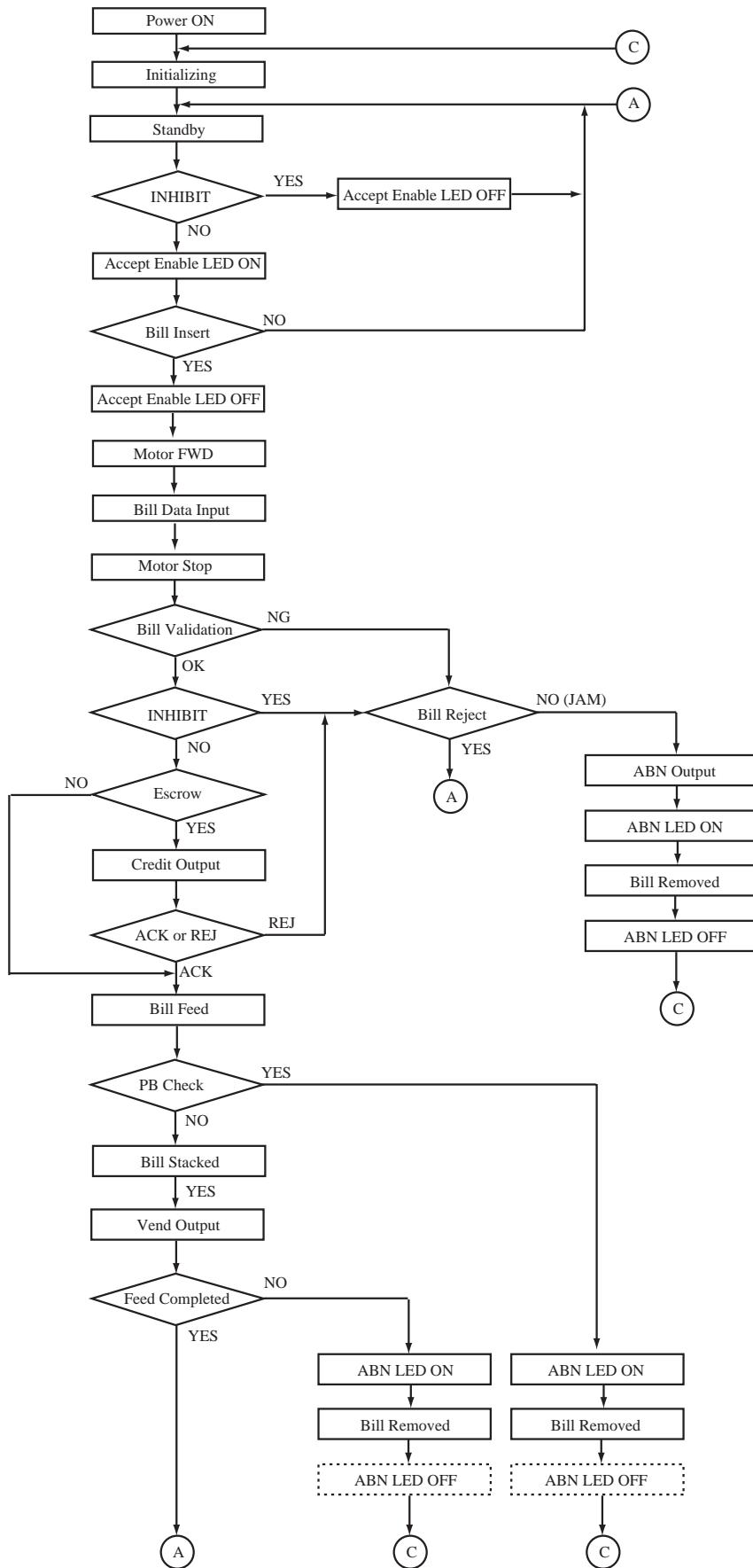
- *1 This connector can connector the special faceplate. For details, refer to 2-2-2. CN4 Connector.
- *2 Interface IFU-001 to adjust with VM-450 (EDP# 059301)
- *3 Communication harness needs to be prepared by customer. Refer to 2-2. Connectors and Pin Assignment.

ATTENTION!

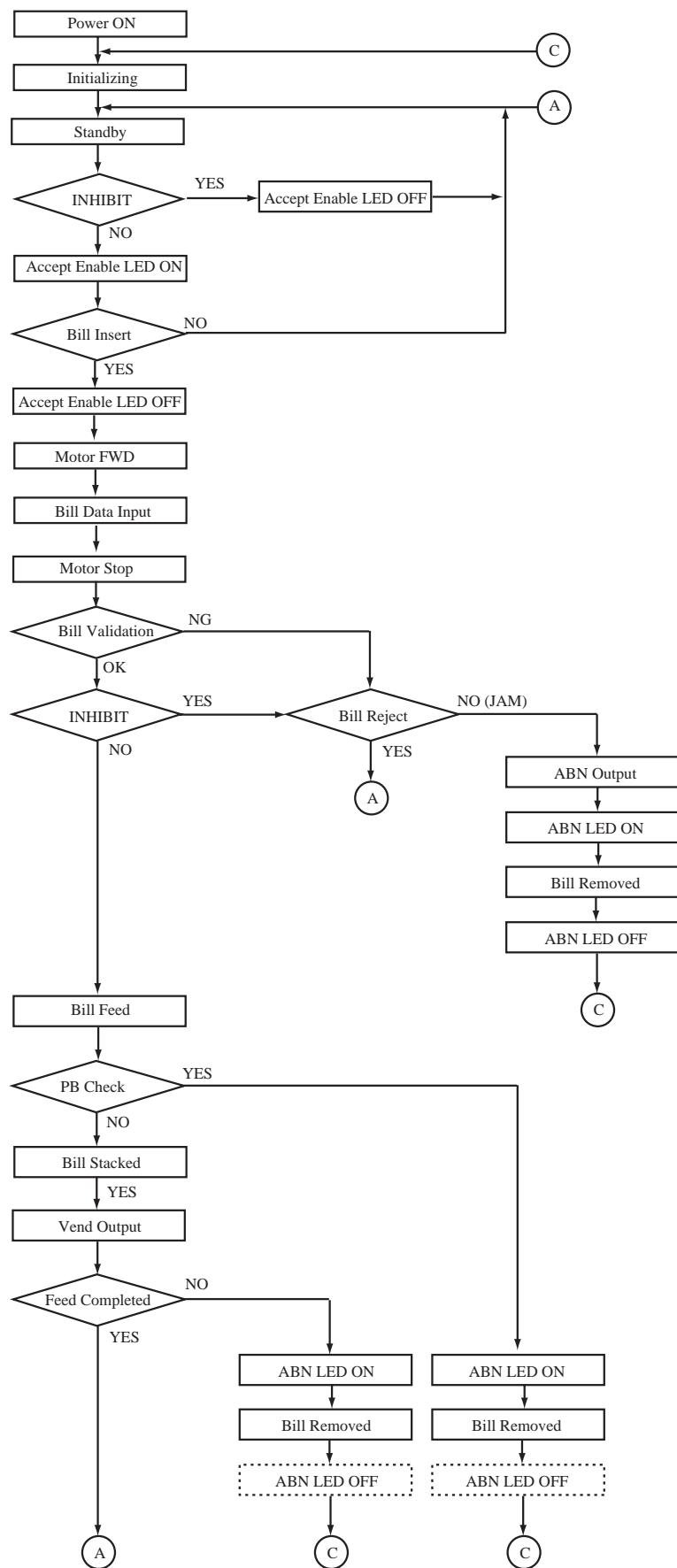
The adjustment is possible with MIB 232 Testadaptor or VM-450 with IFU-001.

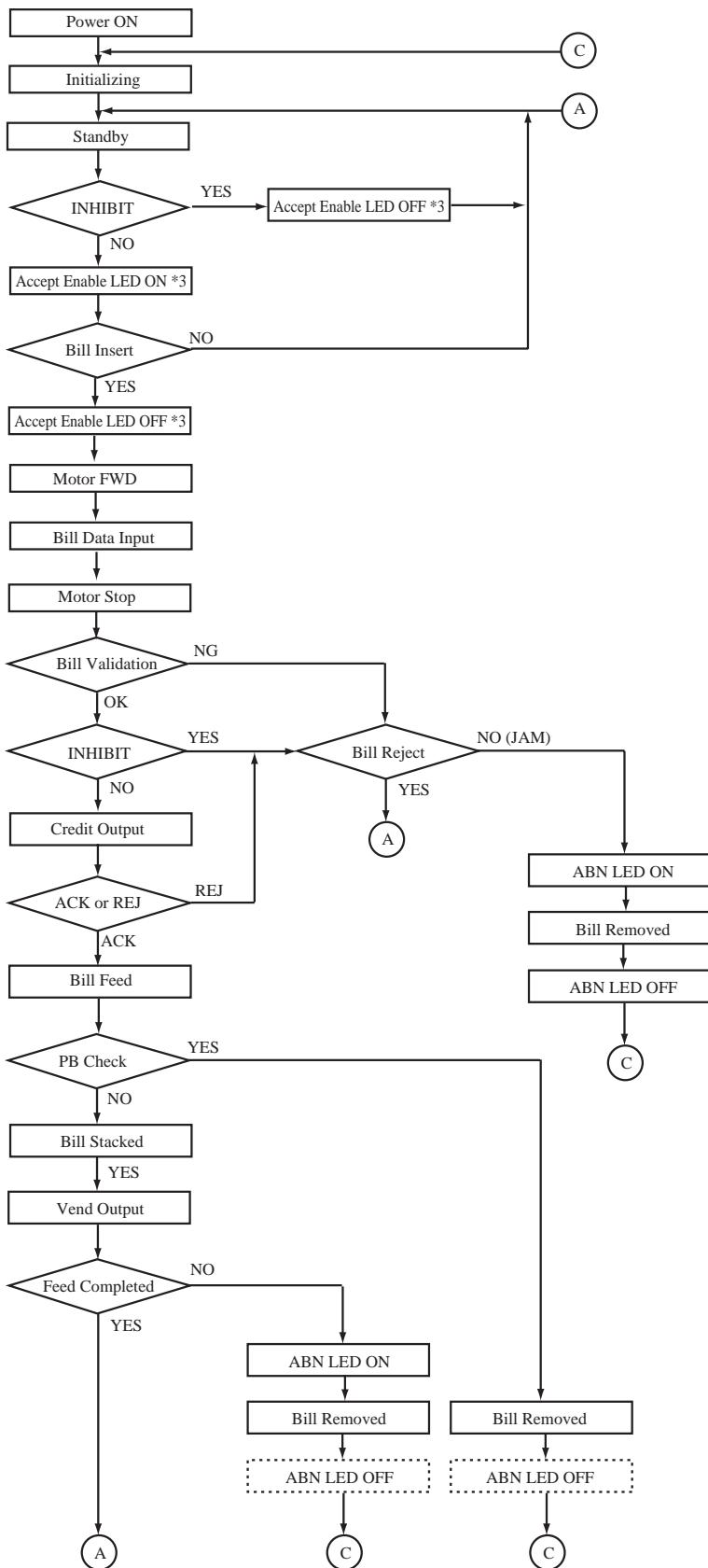
1-5. Operation Flow Chart

1-5-1. ID-0A2 Interface Operation Flowchart (Parallel Mode)

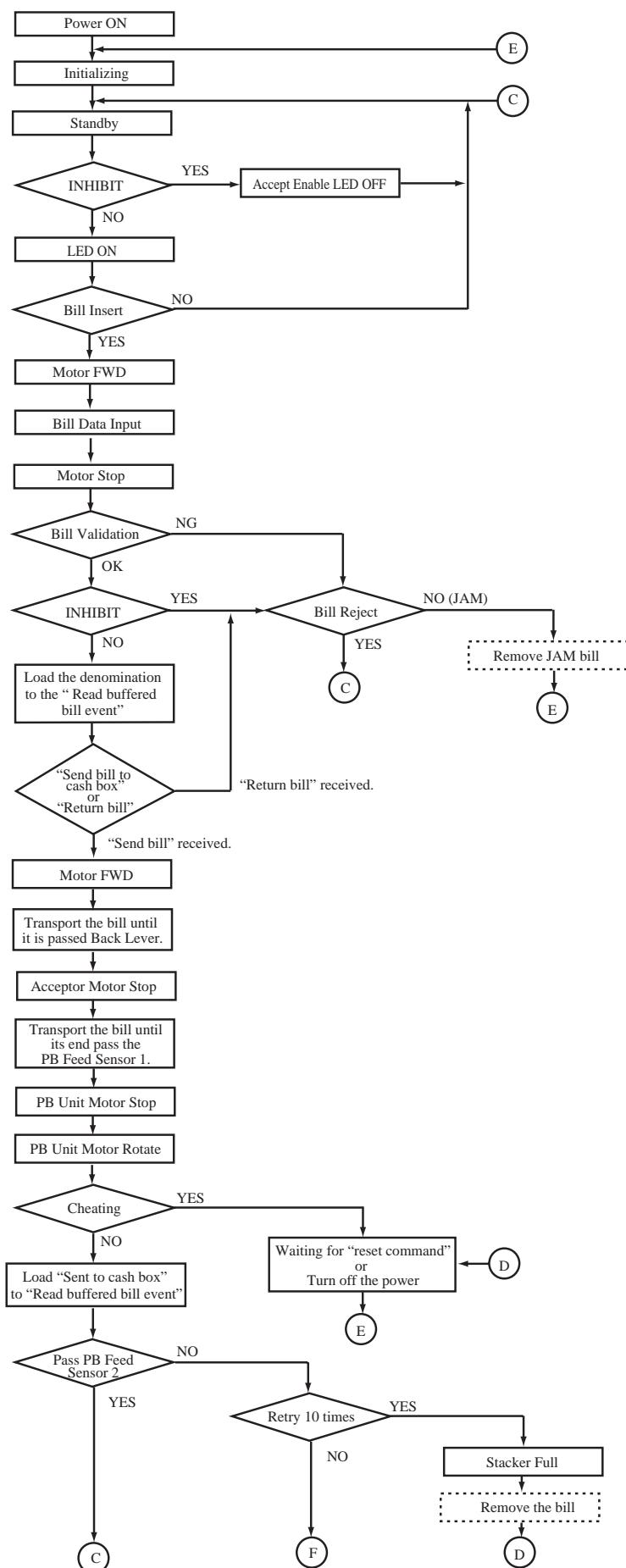


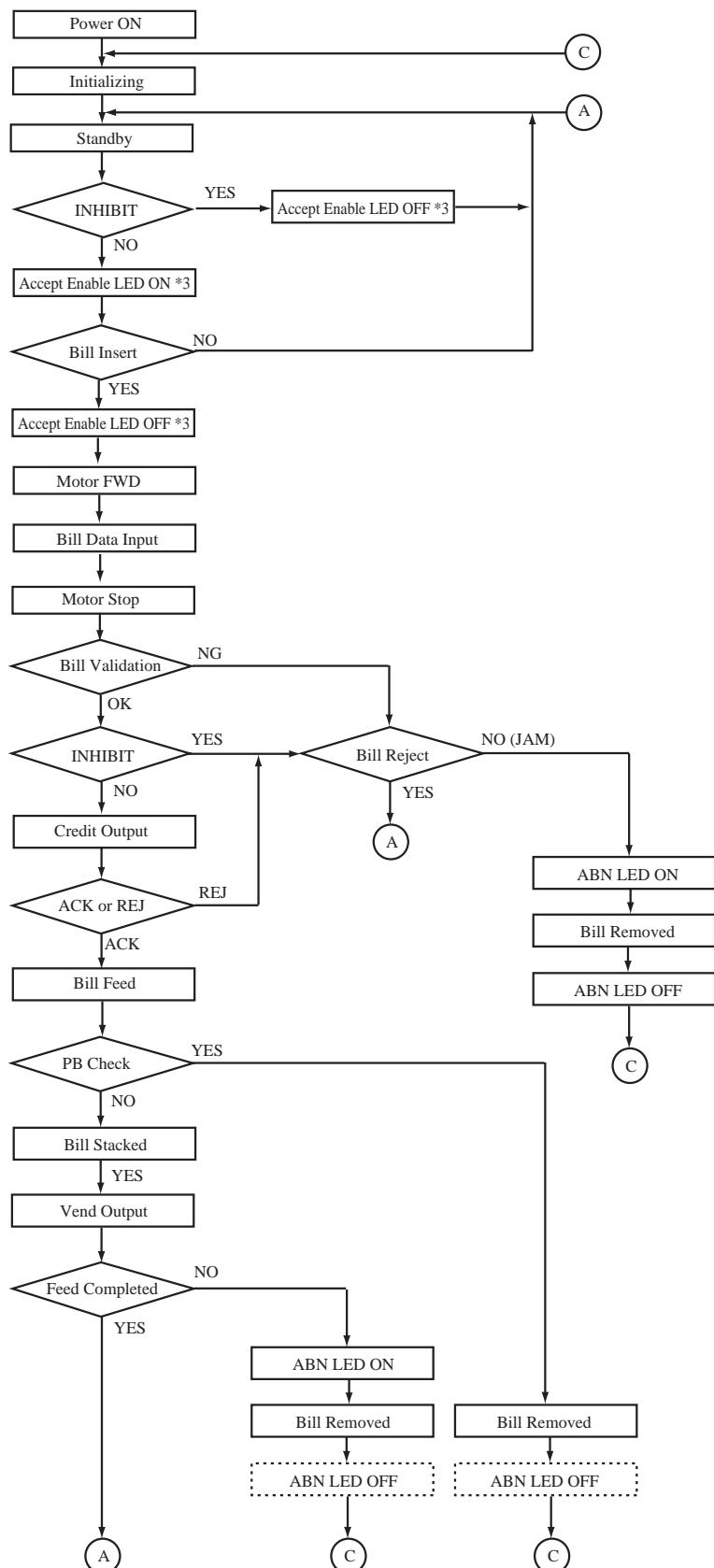
1-5-2. ID-0A2 Interface Operation Flowchart (Pulse Mode)



1-5-3. ID-003 Interface Operation Flowchart

1-5-4. ID-0E3 Interface Operation Flowchart



1-5-4. ID-082A Interface Operation Flowchart

Chapter 2

Specifications

- 2-1. Specification
- 2-2. Connector and Pin Assignment
- 2-3. Interface Circuit
- 2-4. Outline Dimension
- 2-5. DIP Switch Setting

2-1. Specification

2-1-1. Basic Specifications

Accepting Note	Length	125mm to 170mm
	Width	EBA-21-PB: 65mm to 78mm EBA-22-PB2: 72mm to 85mm
Insertion Direction *1	4-Way	
Accepting Rate *1	90% or higher	
Anit-Picking Mechanism	Lever and Radiation Sensor Combination Mechanical Anti-Picking Unit	
Interface Protocol *2	ID-0A2/ID-082A/ID-003/ID-0E3	
Escrow *1	1 note	
LED	1 Diagnostic LED (On CPU board) 4 LEDs (Possible to drive)	

*1 It may differ depending on the country software. For details, refer to the Software Information Sheet.

*2 It can be selected with DIP Switch. See=> 2-5. DIP Switch Setting

2-1-2. Electrical Specifications

Power Supply Voltage	DC12V ±5%
Rated Power Consumption	Standby: Approx. 250mA Operation: Approx. 400mA (Max. 900mA)

2-1-3. Environmental Specifications

Operation Temperature	0°C to 40°C
Storage Temperature	-20°C to 70°C
Operation Humidity	30%RH to 85%RH (No condensing)
Storage Humidity	30%RH to 85%RH (No condensing)
Light Disturbance	Avoid direct sunlight
Installation	Indoor only

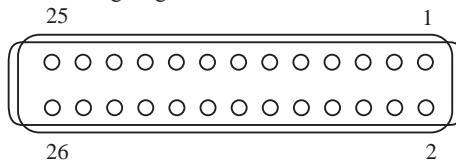
2-1-4. Structural Specifications

Mounting	Holizontal Mounting (No vibration)
Weight	EBA-21-PB: Approx. 1.25kg EBA-22-PB2: Approx. 1.3kg
Outline Dimensions	EBA-21-PB: 108mm(W) x 88.5mm(H) x 208mm(D) EBA-22-PB2: 116mm(W) x 88.5mm(H) x 208mm(D)
Cahsbox	Cashbox needs to be prepared by customer.

2-2. Connector and Pin Assignment

2-2-1. Interface Connector

The following diagram is the Interface connector as viewed from the acceptor side.



Box Type Plug XG4C-2634 (Omron)

■ Recommended Parts

MIL Type Socket: XG4M-2630-T (OMRON)

Lock Lever: XG4Z-0002 (OMRON)

Applicable Wire: 1.27 pitch flat cable AWG28 UL2651

2-2-1-1. ID-0A2 Interface (Parallel Mode) Pin Assignment

Pin No.	Signal Name	I/O *1	ACTIVE	Function
1	VCC			Power Supply DC12V (+5%)
3				
2	VSS			GND
4				
5	VEND1 (+) (-)	OUT	LO	Received currency type signal
6				
7	VEND2 (+) (-)	OUT	LO	Received currency type signal
8				
9	VEND3 (+) (-)	OUT	LO	Received currency type signal
10				
11	BUSY (+) (-)	OUT	HI	Signal to be output during acceptor operation
12				
13	ABN (+) (-)	OUT	HI	Signal to be output when an error has occurred in the acceptor
14				
15	INH (+) (-)	IN	HI	Bill reception inhibit signal. *1
16				
17	ACK (+) (-)	IN	LO	Signal sent from external device to store bill after validator output the VEND signal.
18				
19	REJ (+) (-)	IN	LO	Signal sent from external device to store bill after validator output the VEND signal.
20				
21	DATA (+) VALID (-)	OUT	LO	Final signal of the VEND signal.
22				
23	STKF (+) (-)	OUT	HI	Signal to be output when the stacker is full.
24				
25	NC			Not used.
26	NC			

*1 When the INH signal line is not connected, the acceptor is put in the bill reception inhibit status. If the INH signal is not used, connect Pin No.15 to VCC and Pin. No. 16 to Vss.

2-2-1-2. ID-0A2 Interface (Pulse Mode) Pin Assignment

Pin No.	Signal Name	I/O *1	ACTIVE	Function
1	VCC			Power Supply DC12V (+5%)
3				
2	VSS			GND
4				
5	VEND1 (+) (-)	OUT	LO	Received currency type signal
6				
7	NC			Not used.
8				
9	NC			Not used.
10				
11	BUSY (+) (-)	OUT	HI	Signal to be output during acceptor operation
12				
13	ABN (+) (-)	OUT	HI	Signal to be output when an error has occurred in the acceptor
14				
15	INH (+) (-)	IN	HI	Bill reception inhibit signal. *1
16				
17	NC			Not used.
18				
19	NC			Not used.
20				
21	NC			Not used.
22				
23	STKF (+) (-)	OUT	HI	Signal to be output when the stacker is full.
24				
25	NC			Not used.
26				

*1 When the INH signal line is not connected, the acceptor is put in the bill reception inhibit status. If the INH signal is not used, connect Pin No.15 to VCC and Pin. No. 16 to Vss.

2-2-1-3. ID-003/ID-0E3 Interface Pin Assignment

Pin No.	Signal Name	I/O *1	ACTIVE	Function
1	VCC			Power Supply DC12V (+5%)
3				
2	VSS			GND
4				
5	NC			Not used.
6	NC			
7	NC			Not used.
8	NC			
9	NC			Not used.
10	NC			
11	NC			Not used.
12	NC			
13	NC			Not used.
14	NC			
15	NC			Not used.
16	NC			
17	NC			Not used.
18	NC			
19	NC			Not used.
20	NC			
21	NC			Not used.
22	NC			
23	NC			Not used.
24	NC			
25	TXD	OUT	LO	Output signal line from the acceptor.
26	RXD	IN	LO	Input signal line from the controller.

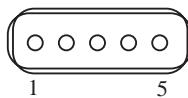
2-2-1-4. ID-082A Interface Pin Assignment

Pin No.	Signal Name	I/O *1	ACTIVE	Function
1	VCC			Power Supply DC12V (+5%)
3				
2	VSS			GND
4				
5	VEND1 (+)	OUT	LO	Received currency type signal
6	(-)			
7	VEND2 (+)	OUT	LO	Received currency type signal
8	(-)			
9	VEND3 (+)	OUT	LO	Received currency type signal
10	(-)			
11	BUSY (+)	OUT	HI	Signal to be output during acceptor operation
12	(-)			
13	ABN (+)	OUT	LO	Signal to be output when an error has occurred in the acceptor
14	(-)			
15	INH (+)	IN	HI	Bill reception inhibit signal. *1
16	(-)			
17	ACK (+)	IN	LO	Signal sent from external device to store bill after validator output the VEND signal.
18	(-)			
19	REJ (+)	IN	LO	Signal sent from external device to store bill after validator output the VEND signal.
20	(-)			
21	VEND4 (+)	OUT	LO	Received currency type signal
22	(-)			
23	STKF (+)	OUT	HI	Signal to be output when the stacker is full.
24	(-)			
25	NC			
26	NC			Not used.

*1 When the INH signal line is not connected, the acceptor is put in the bill reception inhibit status. If the INH signal is not used, connect Pin No.15 to VCC and Pin. No. 16 to Vss.

2-2-2. CN4 Connector

The following diagram is the CN4 connector as viewed from the acceptor side.



Box Type Plug IL-S-5P-S2L2-EF (JAE)

■Recommended Parts

Hosing: IL-S-5S-S2C2-S (JAE)

Contact: IL-S-C2-S-10000 (JAE)

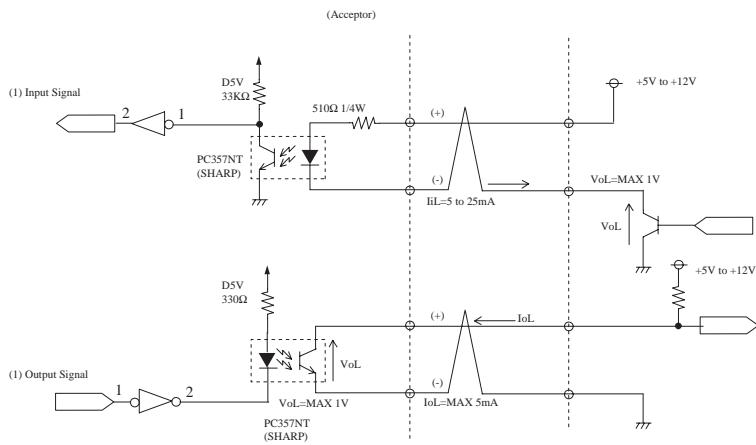
Applicable Wire: AWG26 UL1007

2-2-2-1. CN4 Connector Pin Assignment

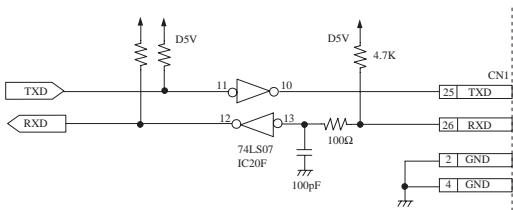
Pin No.	Signal Name	Function
1	LED1	Signal output to turn on the LED when a bill can be received.
2	LED2	Signal output to turn on the LED when a bill can be received.
3	LED3	Signal output to turn on the LED when an error is detected or during a trouble status.
4	LED4	Signal output to turn on the LED when an error is detected or during a trouble status.
5	GND	GND

2-3. Interface Circuit

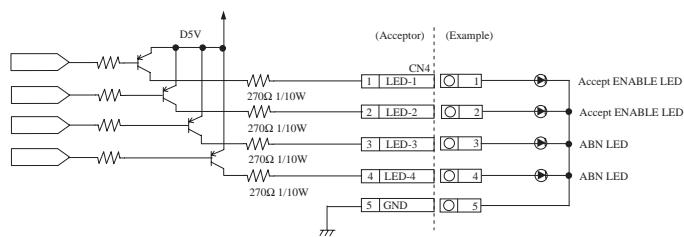
2-3-1. ID-0A2/ID-082A Interface Circuit



2-3-2. ID-003/ID-0E3 Interface Circuit



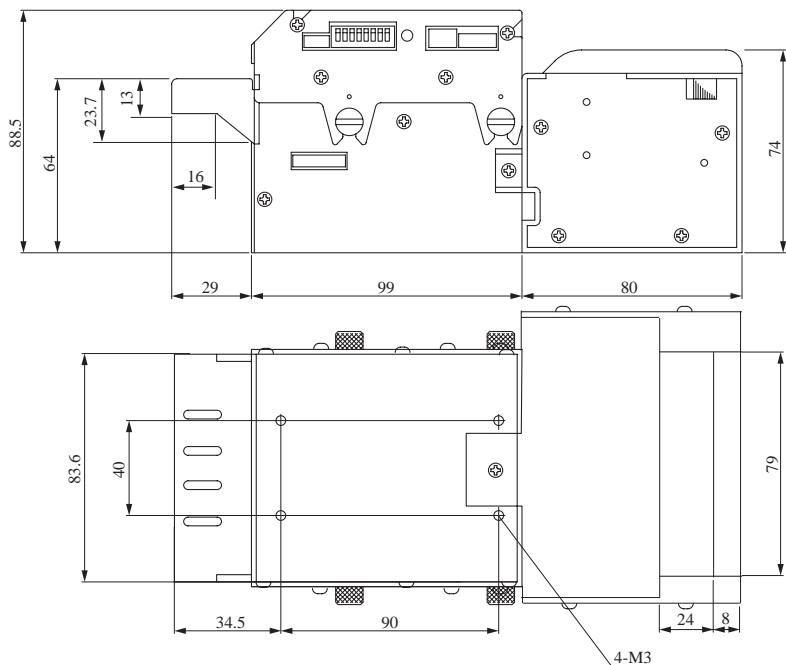
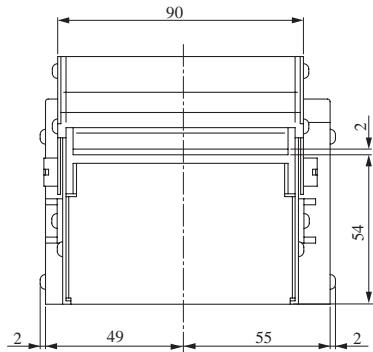
2-3-3. LED Drive



2-4. Outline Dimension

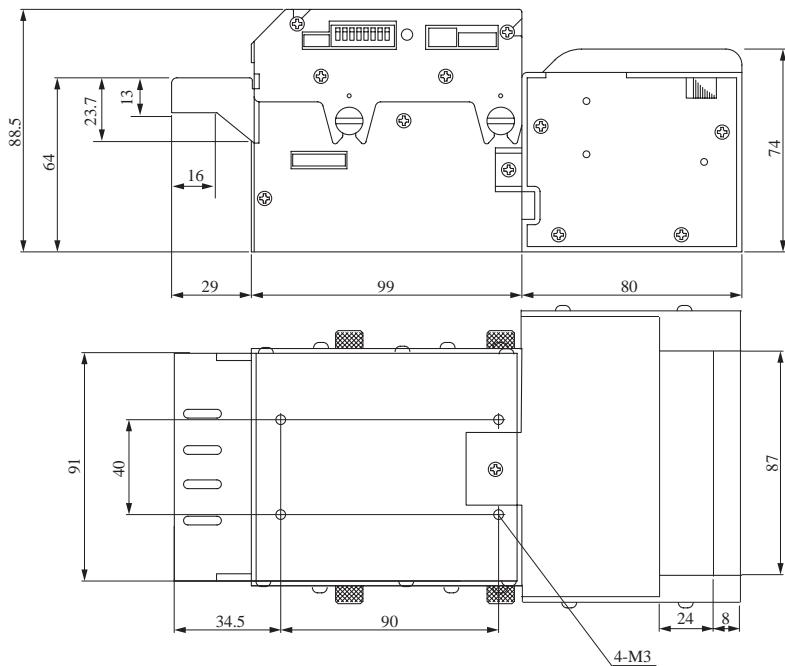
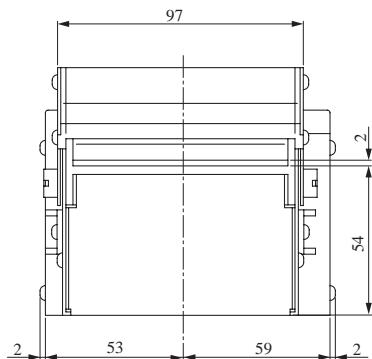
2-4-1. EBA-21-PB Outline Dimension

Unit: mm



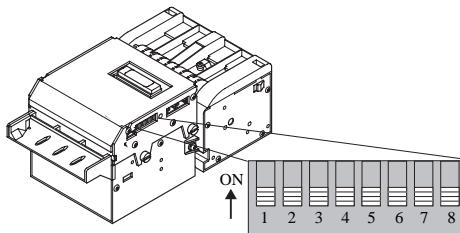
2-4-2. EBA-22-PB2 Outline Dimension

Unit: mm



2-5. DIP Switch Setting

Dip Swith is located on the right side of the Acceptor head.



2-5-1. When using ID-0A2

SW No.	ON/OFF	Description																	
1	OFF	Setting to OFF																	
	ON	For Test and Adjustment Mode																	
8	OFF Parallel Mode		ON Pulse Mode																
2	OFF	Escrow Mode		<table border="1"> <thead> <tr> <th>SW2</th> <th>SW3</th> <th>Pulse Width</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>150ms/180ms</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>80ms/120ms</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>50ms/50ms</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>50ms/300ms</td> </tr> </tbody> </table>	SW2	SW3	Pulse Width	OFF	OFF	150ms/180ms	ON	OFF	80ms/120ms	OFF	ON	50ms/50ms	ON	ON	50ms/300ms
SW2	SW3	Pulse Width																	
OFF	OFF	150ms/180ms																	
ON	OFF	80ms/120ms																	
OFF	ON	50ms/50ms																	
ON	ON	50ms/300ms																	
ON	Non Escrow Mode																		
3	OFF	Setting to OFF																	
	ON																		
4	OFF	Setting to OFF		<table border="1"> <thead> <tr> <th>SW4</th> <th>Pulse Count</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>*1</td> </tr> <tr> <td>ON</td> <td></td> </tr> </tbody> </table>	SW4	Pulse Count	OFF	*1	ON										
SW4	Pulse Count																		
OFF	*1																		
ON																			
ON																			
5	OFF	Acceptor Only Operation																	
	ON	With PB Unit Operation																	
6	OFF	Setting to OFF																	
	ON	Use for Enable /Disable Denomination setting																	
7	OFF	Setting to OFF *1																	
	ON																		

*1 For details, refer to the software information sheet.

2-5-2. When using ID-003

SW No.	ON/OFF	Description
1	OFF	Setting to OFF
	ON	For Test and Adjustment Mode
2	OFF	Acceptor Only Operation
	ON	With PB Unit Operation
3	OFF	High Security Mode
	ON	Normal Security Mode
4 *1	OFF	Denomination 1 Accept
	ON	Denomination 1 Inhibit
5 *1	OFF	Denomination 2 Accept
	ON	Denomination 2 Inhibit
6 *1	OFF	Denomination 3 Accept
	ON	Denomination 3 Inhibit
7 *1	OFF	Denomination 4 Accept
	ON	Denomination 4 Inhibit
8 *1	OFF	Denomination 5 Accept
	ON	Denomination 5 Inhibit

*1 For details, refer to the software information sheet.

2-5-3. When using ID-0E3

SW No.	ON/OFF	Description
1	OFF	Setting to OFF
	ON	For Test and Adjustment Mode
2	OFF	Encryption Mode
	ON	Non Encryption Mode
3	OFF	Acceptor Only Operation
	ON	With PB Unit Operation
4 *1	OFF	Denomination 1 Accept
	ON	Denomination 1 Inhibit
5 *1	OFF	Denomination 2 Accept
	ON	Denomination 2 Inhibit
6 *1	OFF	Denomination 3 Accept
	ON	Denomination 3 Inhibit
7 *1	OFF	Denomination 4 Accept
	ON	Denomination 4 Inhibit
8 *1	OFF	Setting to OFF
	ON	

*1 For details, refer to the software information sheet.

2-5-4. When using ID-082A

SW No.	ON/OFF	Description		
1	OFF	For Test and Adjustment Mode		
	ON	Setting to OFF		
2	OFF		ON	
	Parallel Mode		Pulse Mode	
3	OFF	Setting to OFF	Pulse Width 50ms/50ms	
	ON		Pulse Width 50ms/300ms	
4	OFF	Setting to OFF	SW4	SW5
	ON		OFF	OFF
5	OFF	Setting to OFF	OFF	ON
	ON		ON	OFF
	ON		ON	ON
6 *1	OFF	Denomination 1 Inhibit		
	ON	Denomination 1 Accept		
7 *1	OFF	Denomination 2 Inhibit		
	ON	Denomination 2 Accept		
8 *1	OFF	Denomination 3 Inhibit		
	ON	Denomination 3 Accept		

*1 For details, refer to the software information sheet.

NOTE

Chapter 3

Installation/ Operation

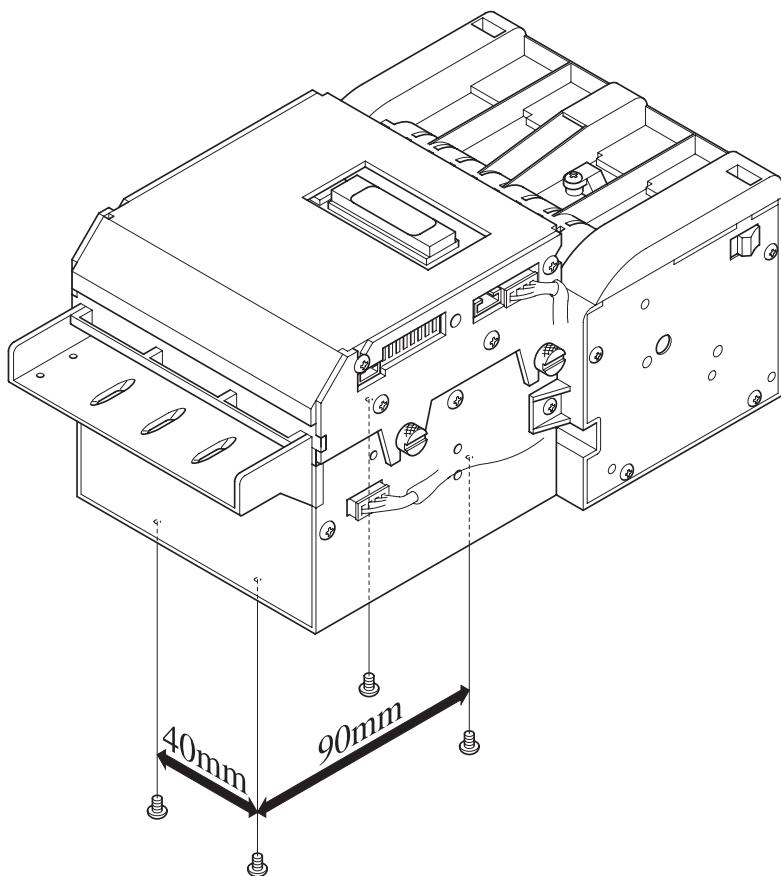
- 3-1. Installing/Removing
- 3-2. Wiring
- 3-3. Clearing Jam Bill

3-1. Installing/Removing

This section describes the procedures for installing of EBA-2X-PBX unit.

Follow the steps given below when installing the EBA-2X-PBX unit.

1. Insert four (4) attachment screws to the hole on the bottom of the unit.
2. Use a screw driver to tighten each attachment screws and secure the EBA-2X-PBX unit in place.



3-2. Wiring

This section describes the procedures for wiring of EBA-2X-PBX unit.

Follow the steps given below when wiring the power harness to the EBA-2X-PBX unit.



- When installing the EBA-2X-PBX unit or wiring the harness, be sure the power harness is unplugged
- The EBA-2X-PBX unit is designed to use only DC12V input. Any other power level can damage the EBA-2X-PBX unit.
- If the power harness is pulled strongly, the power harness may cut out.

3-2-1. Recommended Parts

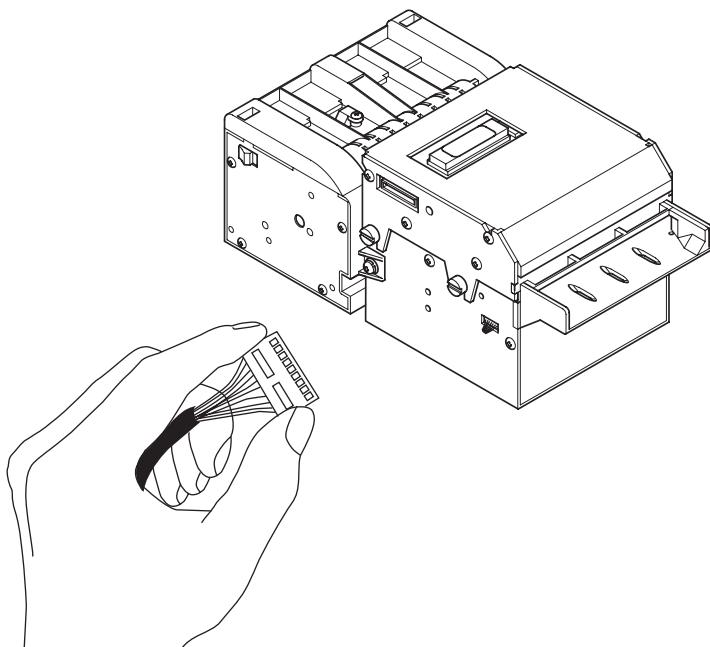
We recommend the following parts for wiring.

MIL Type Socket	XG4M-5630-T (OMRON)
Lock Lever	XG4Z-0002 (OMRON)
Applicable Wire	1.27mm pitch flat cable AWG28 UL2651

3-2-2. Wiring Procedure

When wiring the power harness, follow the procedures given below.

1. Confirm that the power is not supplied to the power harness.
2. Insert the power harness to the interface connector of the EBA-2X-PBX unit.
3. Supply the power and confirm that the EBA-2X-PBX unit operates properly.

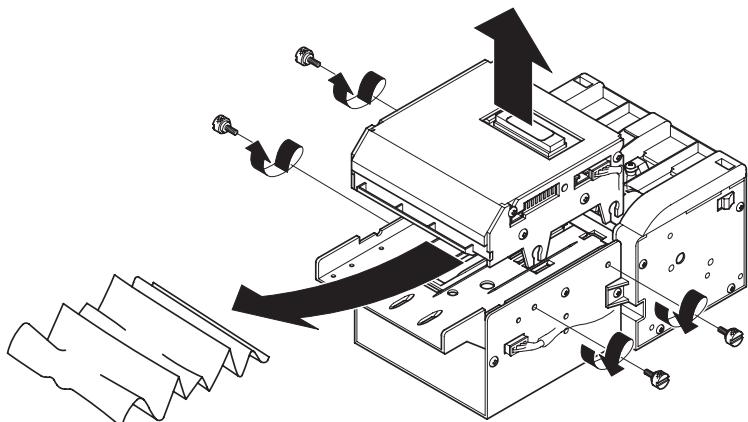


3-3. Clearing Bill JAM

When a bill is jammed inside the EBA-2X-PBX unit, follow the instructions below to remove the bill JAM.

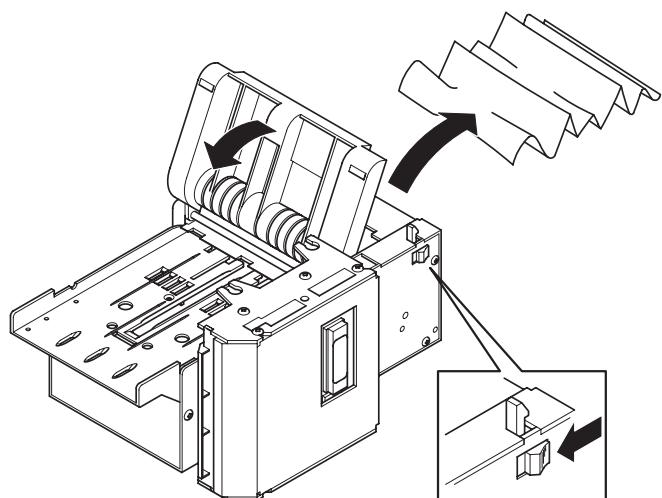
■Open the Acceptor Head

1. Confirm that the power to the EBA-2X-PB2 unit is switched off.
2. Loosen two (2) knobs each of both sides of the acceptor head and open its lid.
3. Pull out the bill JAM.



■Open the PBX Unit

1. Confirm that the power to the EBA-2X-PB2 unit is switched off.
2. Unlock the slide locks on both side of the PBX unit to open its lid.
3. Pull out the bill JAM.



Chapter 4

Adjustment

4-1. Adjustment

4-1. Adjustment

You learn how to adjust EBA-2X-PBX unit in this section.

4-1-1. Requirements

When adjusting EBA-2X-PBX unit, the following items are required.

- EBA-2X-PBX Unit
- JCM Power Test bench (VM-450- EDP#:059307; MIB232-EDP#:G00176)
- Harness ID-0A2(EDP#:059310),ID-003(EDP#:G00053)
- White Reference Paper (Part#: KS-034, EDP#:059300)
- Black Reference Paper (Part#: KS-035, EDP#:059299)
- Paper (Size: 150mm X 70mm, Copying Paper etc.)
- Adjustment Program (EBA1x_2x.exe)
- MAG Tool (MG-03, EDP#:G00179)
- IBM PC or AT compatible machine with a Serial Port (OS: Windows 98SE/2000/XP)

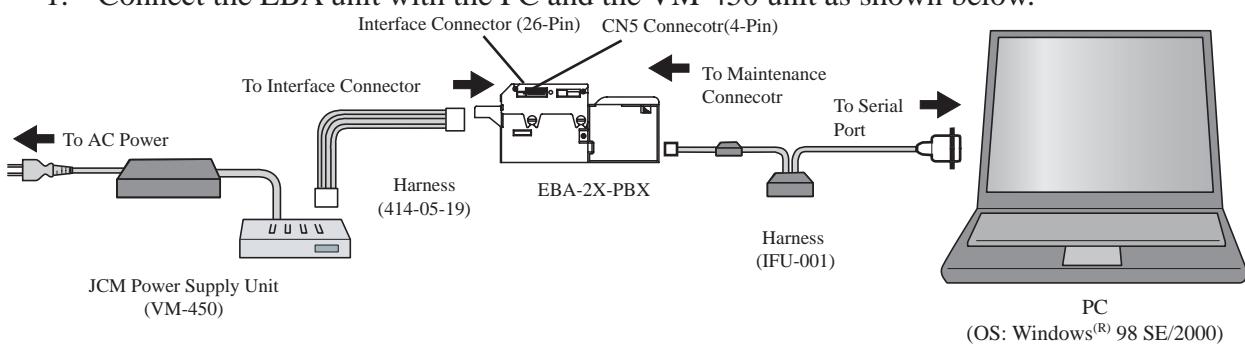


- The Adjustment Program cannot be operated on Windows or Windows MS-DOS Prompt.

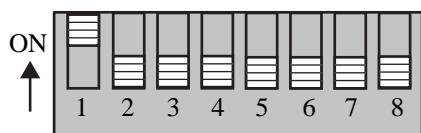
4-1-2. Prior to start adjustment

ID-0A2

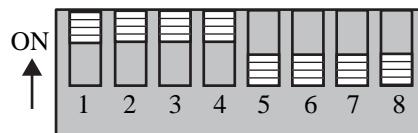
1. Connect the EBA unit with the PC and the VM-450 unit as shown below.



2. Set the EBA unit's DIP Switch No.1 ON and set the VM-450 unit's DIP Switch No. 1, 2, 3, and 4 ON (Set No.5 to 8 OFF) and supply the power.



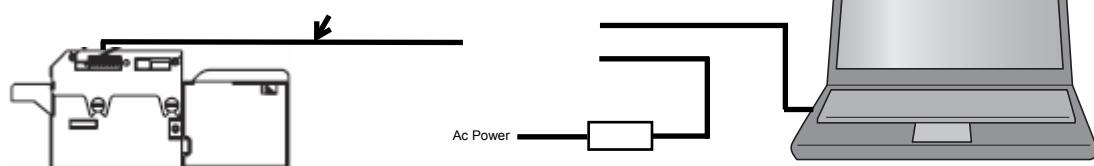
EBA Unit



VM-450 Unit

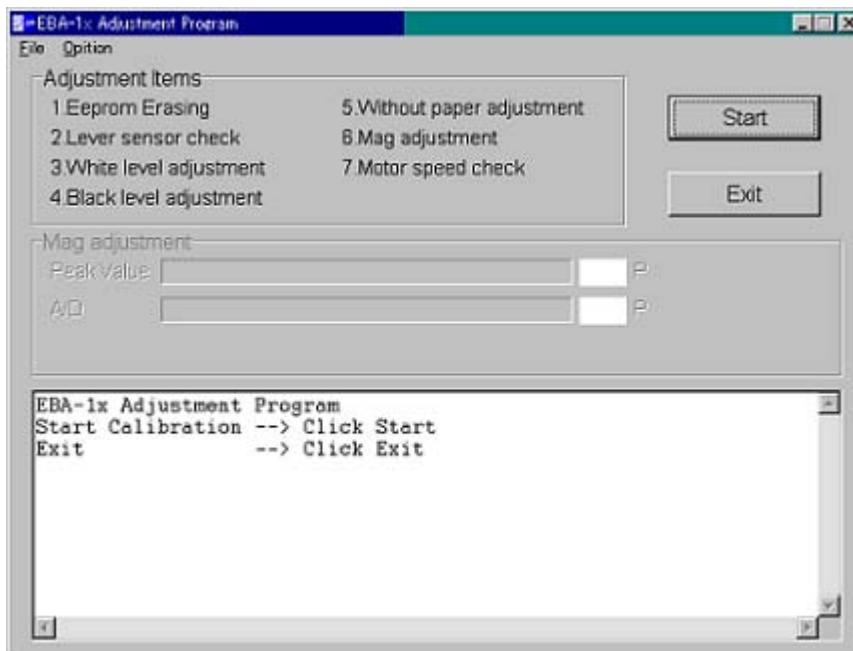
ID-003

cable EDP# G00053

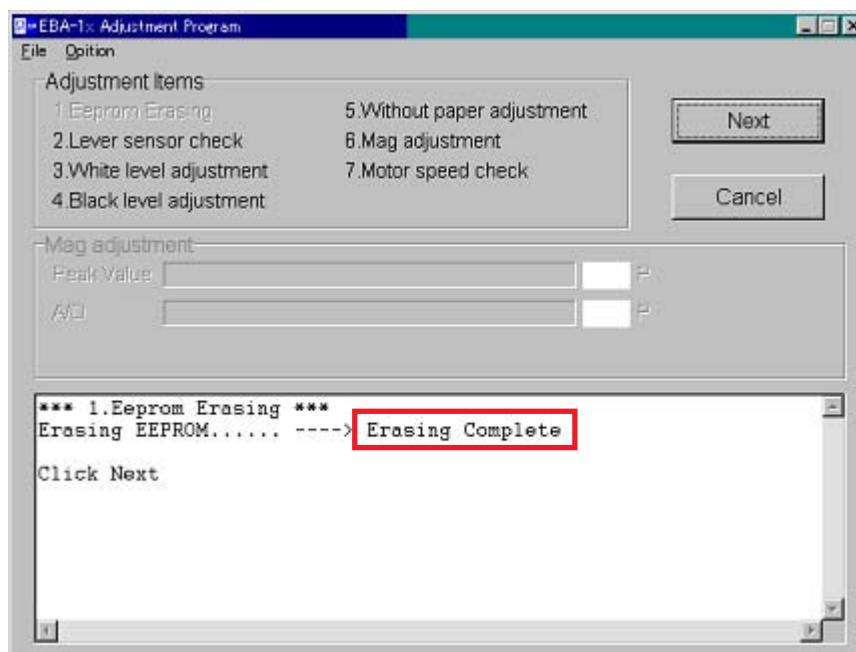


4-1-3. Adjustment Procedure

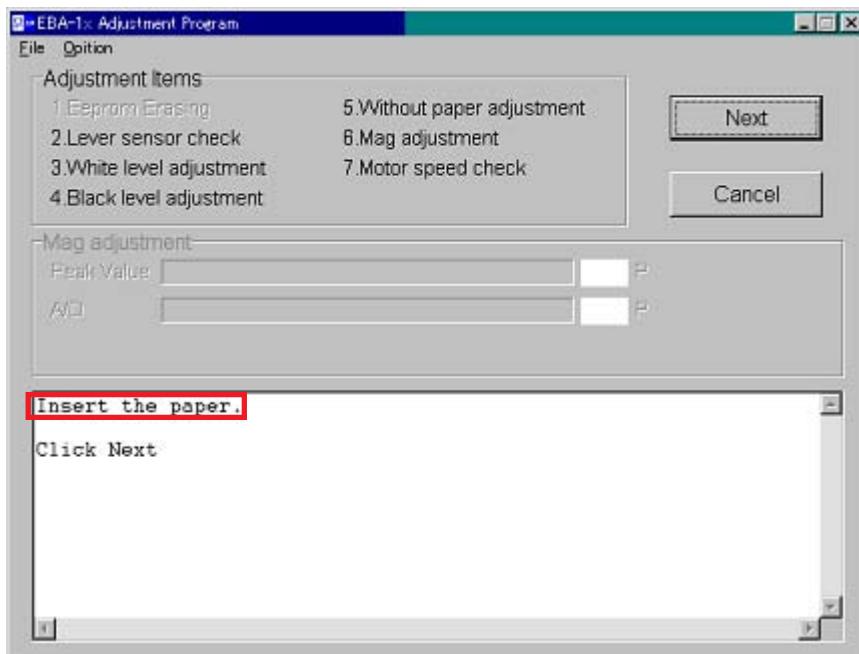
- Double click the EBA-1X_2X.exe to start the adjustment program. Then the following window will appear.



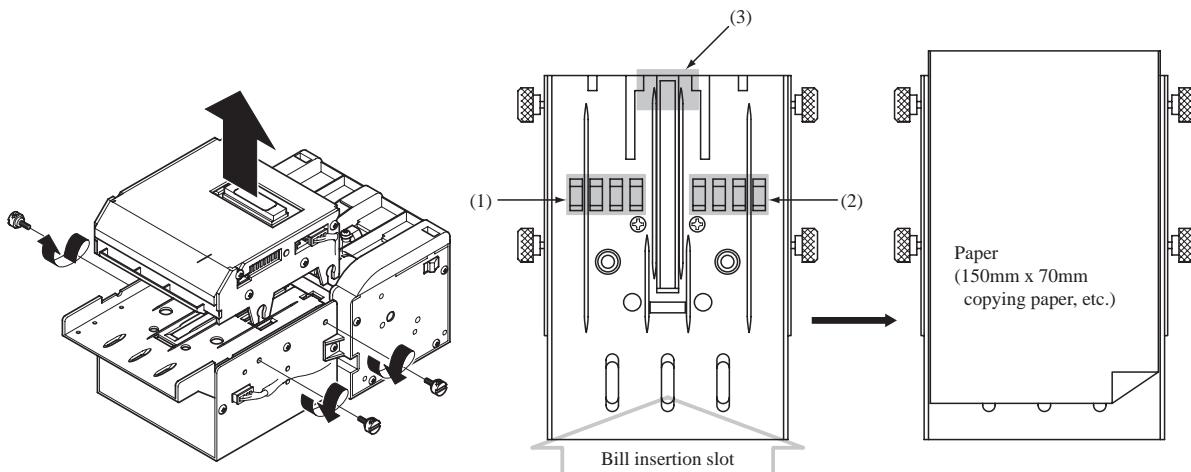
- Press the [Start] button to start the adjustment.
- Confirm that the EEPROM is created and the “Erasing Complete” message appears.



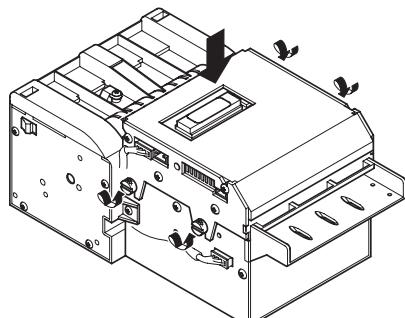
4. Press the [Next] button and then the “Insert the paper.” message will appear.



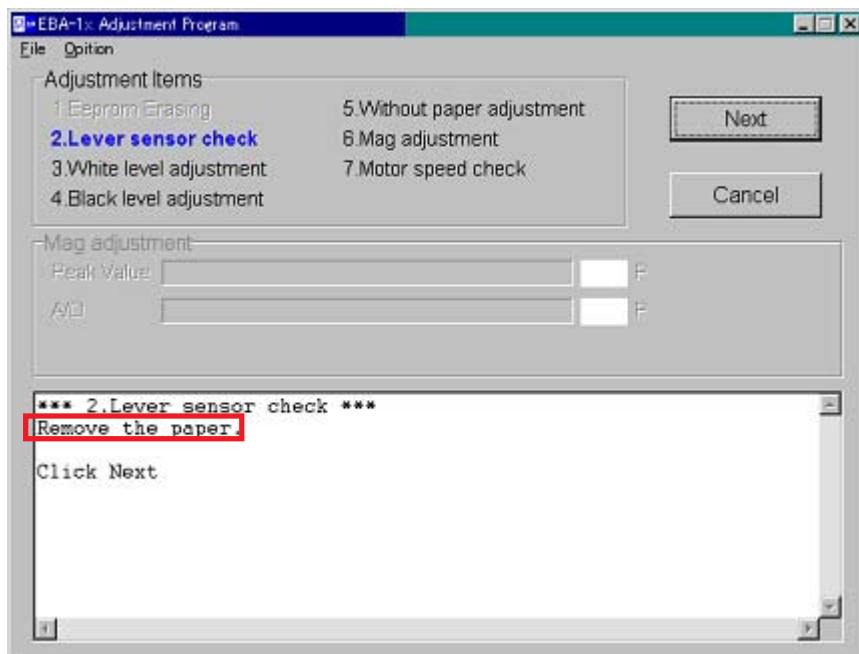
5. Open the EBA tray and insert a paper (150mm X 70mm) such as copying paper.



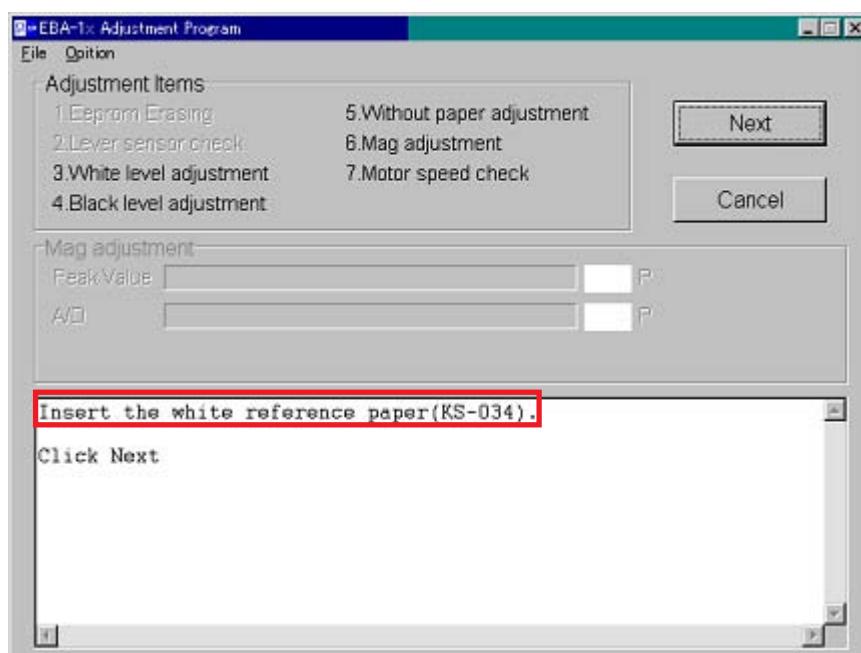
6. Close the tray properly and then press the [Next] button to start the Lever Sensor ON Check .



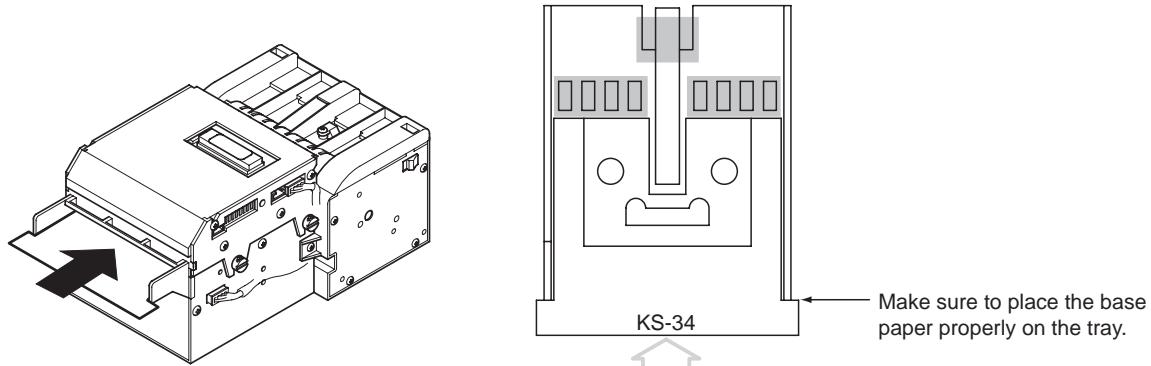
7. After the Lever Sensor ON Check is completed, “Remove the paper.” message will appear.



8. Remove the paper from the EBA unit and then press the [Next] button to start the Lever Sensor OFF Check.
 9. After the Lever Sensor OFF Check is completed, “Insert the white reference paper (KS-034).” will appear.

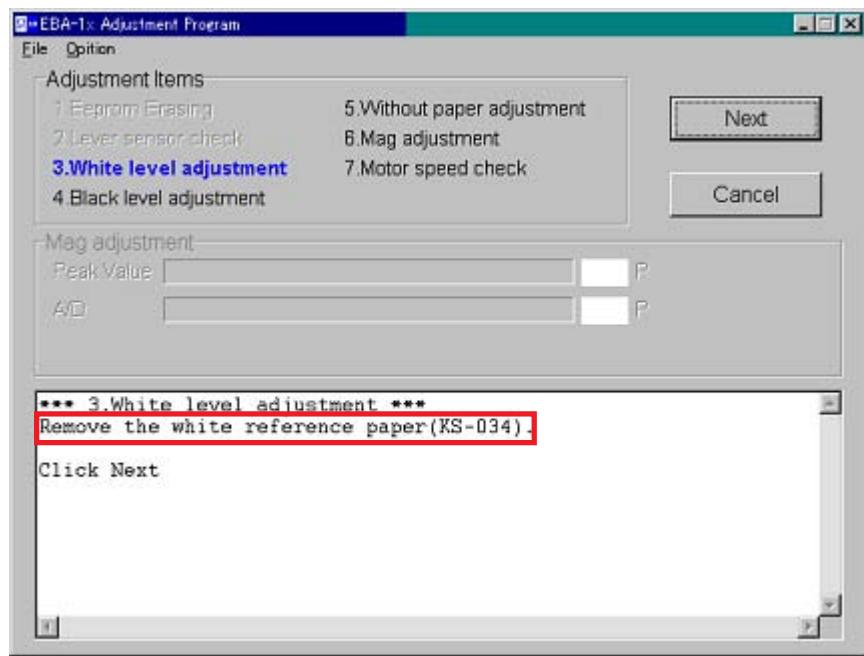


10. Insert the white reference paper (KS-034) to the UBA unit and press the [Next] button to start the White Level Adjustment.



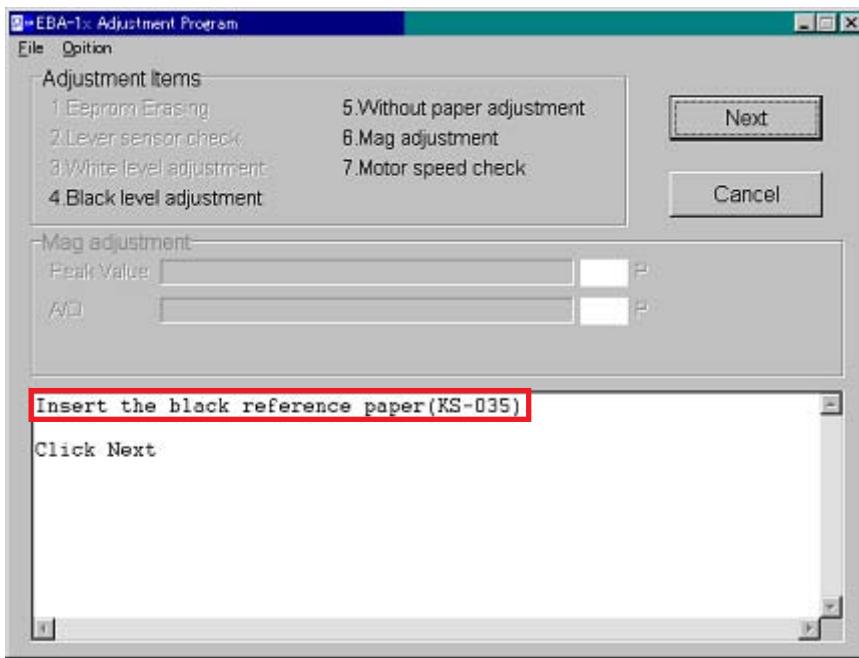
- Be sure to insert the withe reference paper (KS-034) all the way seated.

11. When the White Level Adjustment is completed, the “ Remove the white reference paper (KS-034).” message will appear.



12. Remove the white reference paper (KS-034) from the EBA unit.

13. Then press the [Next] button and the “Insert the black reference paper (KS-035).” will appear.

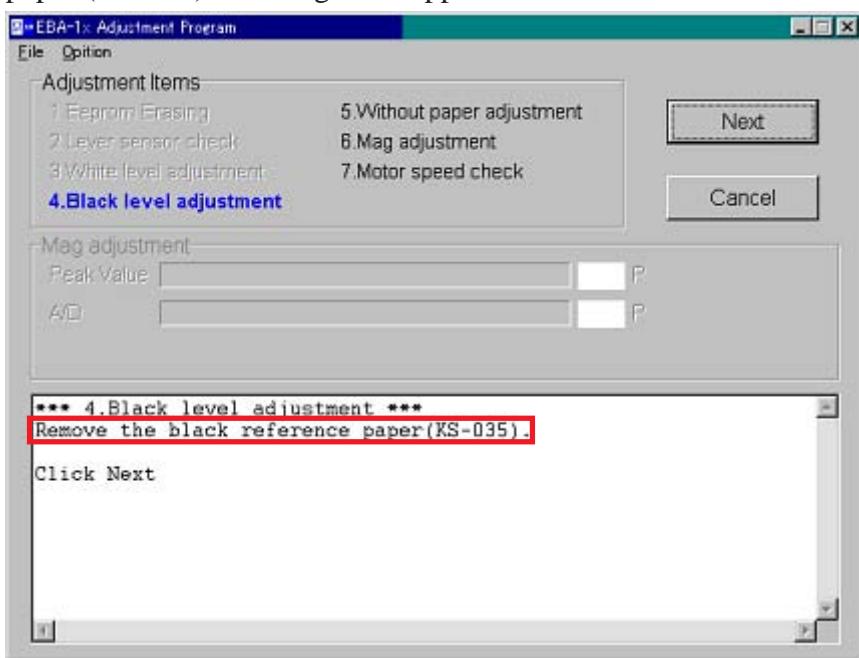


14. Insert the black reference paper (KS-035) to the EBA unit and then press the [Next] button to start the Black Level Adjustment.



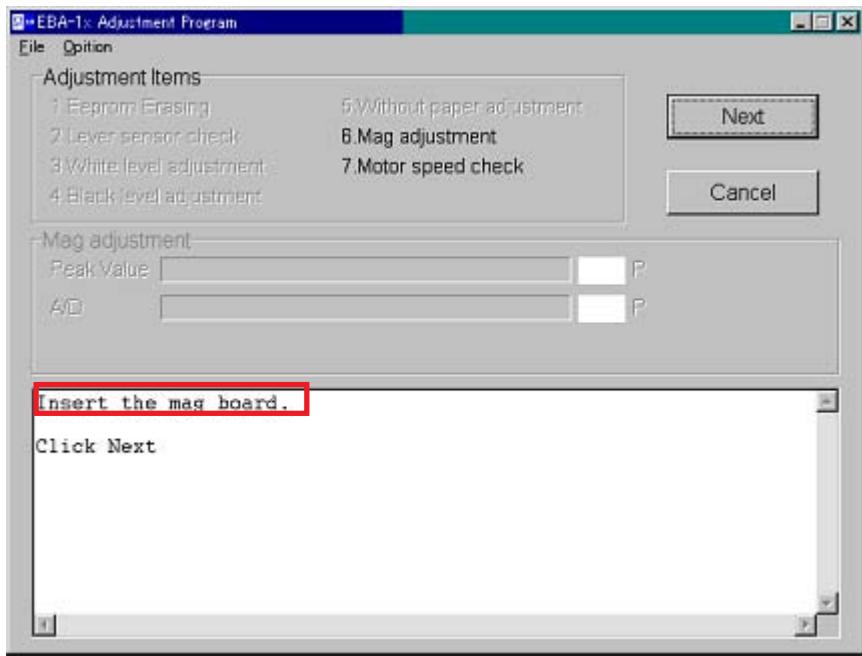
- Be sure to insert the black reference paper (KS-035) all the way seated.

15. After the Black Level Adjustment is completed, the “Remove the black reference paper (KS-035).” message will appear.

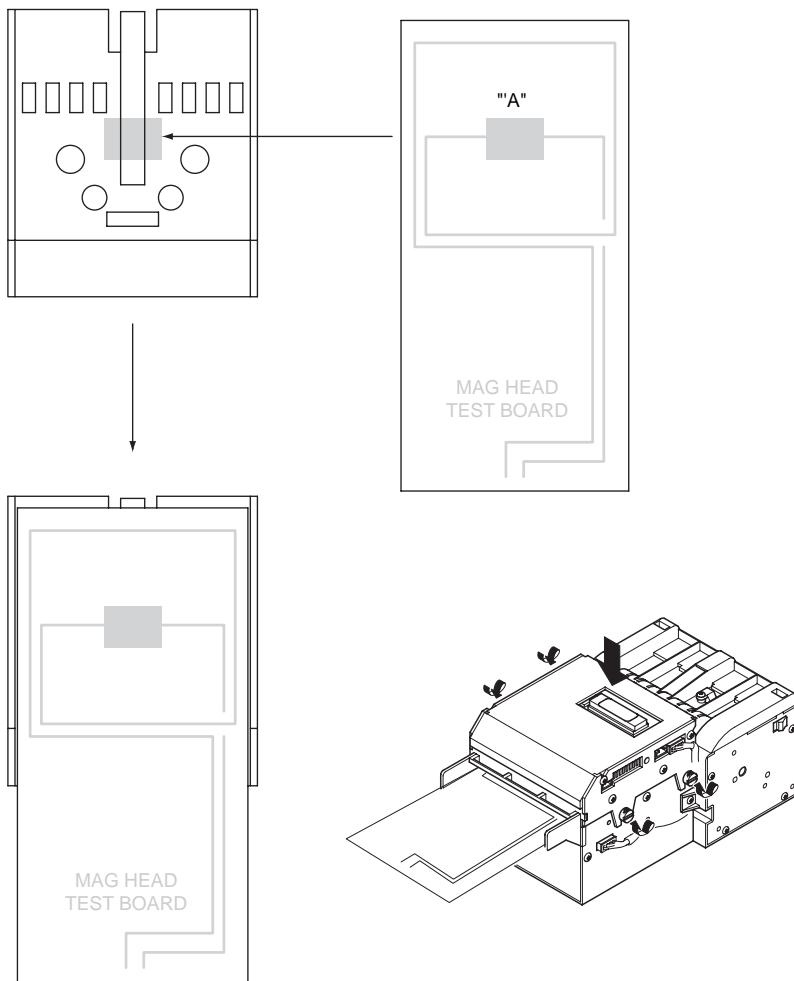


16. Remove the black reference paper (KS-035) from the EBA unit and then press the [Next] button.

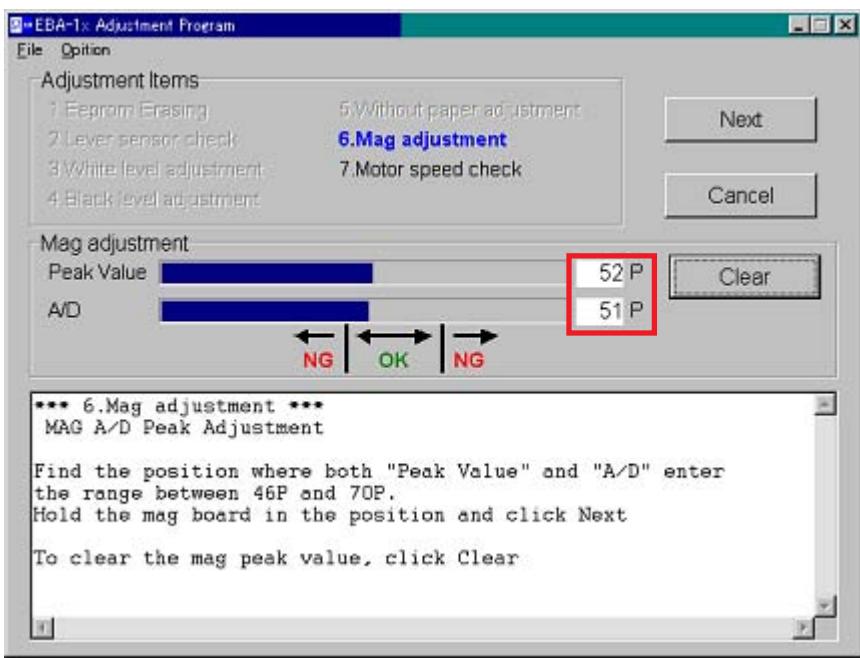
17. After the Without Paper Adjustment is completed, the “Insert the mag board” message will appear.



18. Open the EBA tray and set the MAG Tool (MG-03) unit's MAG board at the specified position. Then close the tray and the knurls on both sides properly.



19. Press the [Next] button and the following window will appear.

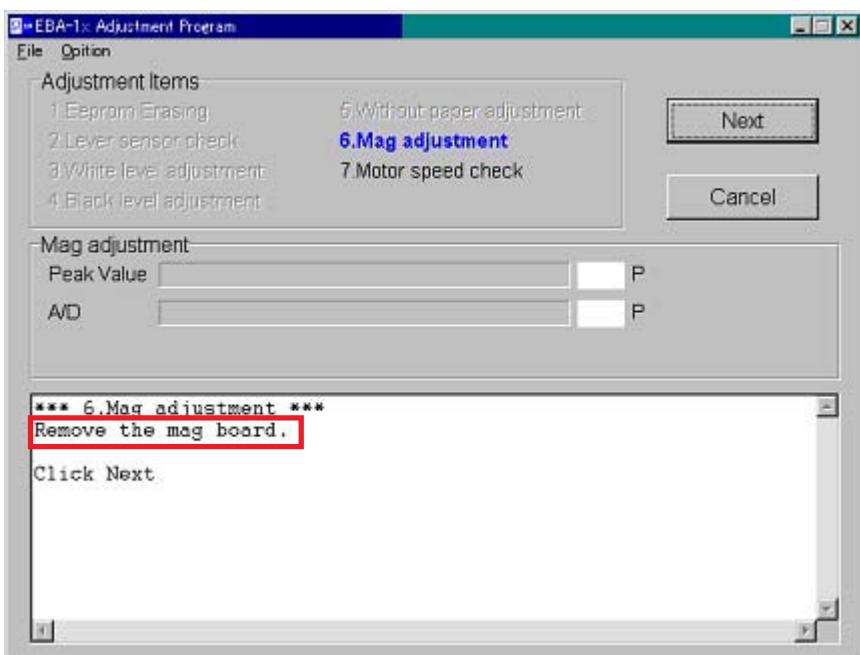


20. Move the MAG board forward back and forth slowly to detect the peak value (Peak 46 to 70).

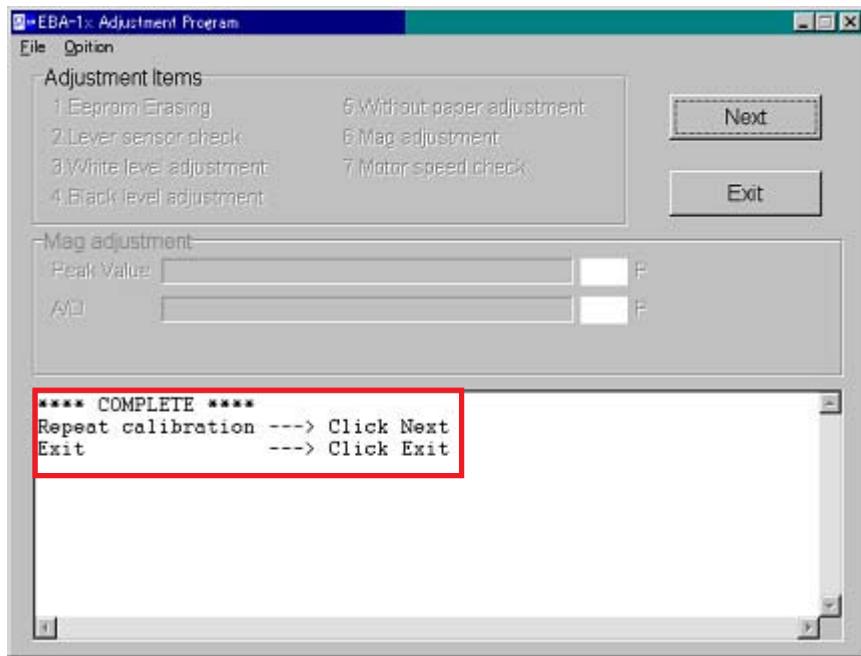


- The difference between the Peak value and the A/D value must be 10P or less. The A/D value must be as close as possible to the Peak Value value.

21. When the peak value reading becomes stable, press the [Next] button to start the Mag Adjustment.
22. After the Mag Adjustment is completed , the “Remove the mag board” message will appear.



23. Remove the Mag Board from the EBA unit and then press the [Next] button to start the Motor Speed Check.
24. After the Motor Speed Check is completed, the following message will appear.



25. This is the end of the adjustment. When adjusting the another EBA unit, press the [Next] button. When closing the program, press the [Exit] button.

Chapter 5

Trouble Shooting/ Maintenace

- 5-1. Error Code/Reject Code
- 5-2. Trouble Shooting
- 5-3. Test Mode (Diagnostics)
- 5-4. Cleaning
- 5-5. Maintenance Tool List
- 5-6. Support

5-1. Error Code/Reject Code

Number of Red flashes of the Diagnostic LED lens indicates the reason for the Error or Rejection. The Diagnostic LED lens is located beside the DIP Switch. If the acceptor operation error occurs, the LED flashes slowly. For details, please refer to 5-1-1. Error Code. If a bill is rejected, the LED flashes rapidly. For details, please refer to 5-1-2. Reject Code.

5-1-1. Error Codes

# of Flashes (Slowly)	Diagnostic Description
4	Bill remains inside the acceptor.
5	Acceptor Feed Motor Speed Error.
6	(1) Acceptor motor was started but does not rotate. (2) Acceptor motor was stopped but does not stop. (3) No signal is sent from the acceptor encoder sensor.
9	(1) PB unit motor was started but does not rotate (2) PB unit motor was stopped but does not stop. (3) No signal is sent from the home sensor of the PB unit.
12	Sensor turned on at a timing impossible in normal operation.

5-1-2. Reject Codes

# of Flashes (Rapidly)	Diagnostic Description
1	Bill was inserted at a crooked angle.
2	Magnetic sensor pattern error
3	Bill stays in the acceptor feed route.
4	Photo sensor error 1.
5	Bill feed error.
6	Judgment error.
7	Photo sensor error 2.
8	Photo sensor error 3.
9	Receiving inhibited bill was rejected.
10	Reject signal was input.
11	Lever Sensor has detected an error.
12	Back Sensor has detected an error.
13	Incorrect length bill.
14	Photo Sensor error 4.
15	Photo Sensor error 5.

5-2. Trouble Shooting

When an error message appears or trouble occurs and the EBA unit does not work properly, recover the EBA unit following the instruction below.

5-2-1. General Troubles

Symptom/Error Message	Possible Causes	Recovery Action
Acceptor is not working (Acceptor does not accept any bill)	Power is not supplied to the acceptor.	Verify the specified voltage and ground are supplied to appropriate pins of the interface connector.
	Connection is wrong.	Verify if all harnesses and connectors are connected properly. Verify if the connector pin has been any bend, missing, broken. Verify if the specified voltage is supplied to the appropriate pin. See=> Chapter 2 Specifications
	CPU Board is Corrupted.	Perform Bill Acceptance Test. See => 5-2-7. Bill Acceptance Test. If the test result is NG, replace the CPU/Mother Head Board. See=> Chapter 6 Replacement procedure After CPU/Mother Head Board is replaced, perform the adjustment. See=> 4-1. Adjustment
JAM bill occurs often.	Feed or Pinch roller is spoiled with dirt or broken.	Clean the feed or Pinch roller. See=> 5-4. Cleaning If any corruption is found, replace it.
	Feed or Pinch roller spring is missing or loose.	Verify the condition of the Feed or Pinch roller spring and replace it as required.
	There is any foreign objects is on the transport path.	Remove the foreign objects from the transport path and clean. See=> 5-4. Cleaning
	Faceplate does not match with the bill width.	Change the faceplate guide depending on the bill width. See=> 6-1. Replace of Faceplate Guide
	The bill width is out of EBA-2X Specifications)	Use the only acceptable bills. See=> Chapter 2 Specifications

Symptom/Error Message	Possible Causes	Recovery Action
Acceptor is not working. (Acceptor does not accept any bills.)	Entrance Sensor is not working or there is any foreign object at the entrance.	Remove the foreign object and clean the entrance sensor. See=> 5-4. Cleaning. Perform Aging. See=>5-3-4. Acceptor Sensor ON/OFF Test If any sensor error is found, replace the LED board. See=> Chapter 6 Replacement Procedure
Acceptance rate is low.	Rollers, belts and lenses is soiled with dirt.	Clean the rollers, belts and lenses. See=> 5-4. Cleaning
	Sensor needs to be adjusted.	Adjust the EBA-2X unit. See=> Chapter 4. Adjustment
	After disassembled, the EBA-2X has not been adjusted.	Adjust the EBA-2X unit. See=> Chapter 4. Adjustment
	The bill that software program is not supported is inserted.	Verify if the denomination, issued year is appropriate in the software information sheet.
All bills are returned.	Software does not match with the currency.	Set the EEPROM with appropriate software program to the EBA-2X unit. See=> 4-1. Download
	DIP Switch setting is wrong.	Set the accepting setting properly. See=> 2-7-3. Denomination Setting
	The command from Host is set to inhibit.	Set the command to accept.
	Motive Head/LED Board failure is occurred.	Replace Mother Head/LED Board. See=> Chapter 6 Replacement Procedure.
	Sensor needs to be cleaned and adjusted.	Clean all sensors. See=> Cleaning Perform adjustment See=>4-2. Adjustment
Motor rotates a few times and stop.	CPU board failure	Replace the CPU board. See=> 6-1. Replacement of CPU Board/Mother Head Board
	DIP Switch setting is wrong.	Set the DIP Switch No.1 ON and supply the power to the EBA-2X unit.
Cannot enter the Test Mode.	DIP Switch is broken.	Perform the DIP Switch TEST. See=> 5-3-11. Acceptor DIP Switch Test. If the test result is NG, replace the CPU board. See=> 6-2. Replace of CPU Board/Mother Head Board
	CPU Board failure	Replace the CPU board. See=>6-2. Replacement of CPU Board/Mother Head Board

5-2-2. Adjustment Troubles

Symptom/Error Message	Possible Causes	Recovery Action
Adjustment Program can not be started.	OS is not applicable.	Our Adjustment program supports only Windows 98SE/2000/XP.
	The program files are corrupted.	Ask JCM for the correct programs.
Communication Error	Wrong or inappropriate connections	Check the connections of PC and EBA-2X connectors. Check for any bent, missing or damaged pins in the connectors.
	DIP switch setting of EBA is not correct.	Set the DIP switch (No.1 to 7 OFF and No.8 ON) of EBA-2X, and turn on the power of VM-450.
	DIP switch failure.	Refer to the 5-3. Test Mode(Diagnostic) and conduct DIP Switch Test.
Adjustment Error	CPU Board failure.	Change the CPU Board. Refer to 6-2. Replacement of CPU Board/Mother Head Board.
	Reference paper is wrong.	Use the reference paper (KS-034/KS-035) for EBA-2X.
	CPU/Mother Head/LED Board failure.	Replace the CPU/Mother Head Board. See=> Chapter 6 Replacement Procedure

5-2-3. Communication Troubles

Symptom/Error Message	Possible Causes	Recovery Action
Cannot communicate with Host	DIP switch setting is wrong.	Set all DIP Switches OFF and supply the power to the EBA-2X unit.
	Connector is unplugged or is not connected properly.	Connect all connector properly.
	Connector pin is broken.	Verify if the connector pin is any bend, broken or missing. Replace the CPU/Mother Head Board as required.
	CPU board failure	Replace the CPU Board. See=> 6-1. Replacement of CPU Board/Mother Head Board
	Interface is wrong.	Verify if the interface is appropriate with Host. If wrong, set the interface properly. See=> 2-5. DIP Switch Setting



- When you cannot solve the problem even if you follow the instruction above, please contact JCM. See => 5-6. Support

5-3. Test Mode (Diagnostics)

EBA-2X-PBX has the diagnostics function. EBA-2X-PBX can be specified the part of the error using the diagnostic function.

5-3-1. DIP Switch Setting List

Test Items	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Feed Motor Forward Rotation Test	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Feed Motor Reverse Rotation Test	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
Acceptor Sensor On/Off Test	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
Acceptor I/F Test (OUT)	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
Acceptor I/F Test (IN)	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
Bill Accepting Test	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
PB Test	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
PB Feed Test	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
PB Speed Test/Feed Speed Test	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
Acceptor DIP Switch Test	OFF	ON						

5-3-2. Transport Motor Forward Rotation Test

Test the condition of the Transport Motor forward rotation.

1. Set the DIP switch No.1 ON and supply the power to the EBA unit.
2. Set the switch No.1 OFF to start the test. The transport motor rotates forward.
3. If the Vend2 and Vend3 of VM-450 unit's LED turns ON, no error is found.



- If the Vend1 and Vend2, or Vend3 and Vend4 of VM-450 unit's LED turns ON, the Transport Mortor has error. Contact your nearest local distributer or JCM.

5-3-3. Transport Motor Reverse Rotation Test

Test the condition of the Transport Motor reverse rotation.

1. Set the DIP switch No.1 and 2 ON and supply the power to the EBA unit.
2. Set the switch No.1 OFF to start the test. The transport motor rotates reverse.
3. If the Vend2 and Vend3 of VM-450 unit's LED turns ON, no error is found.

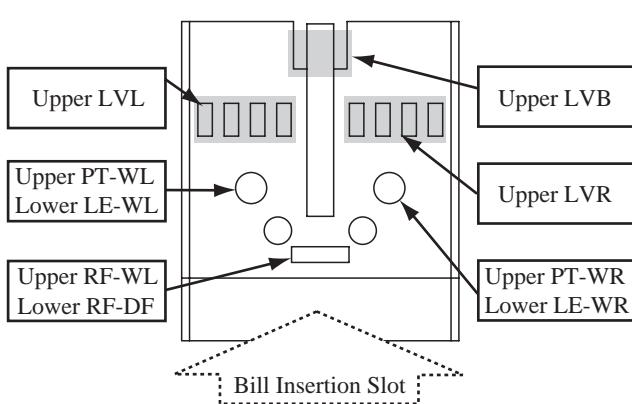


- If the Vend1 and Vend2, or Vend3 and Vend4 of VM-450 unit's LED turns ON, the Transport Mortor has error. Contact your nearest local distributer or JCM.

5-3-4. Acceptor Sensor ON/OFF Test

This test allows you to confirm the acceptor sensor ON/OFF operation. You can perform this test only after performing the adjustment. This test only confirms the operation of sensors which detect whether a bill is present or not.

1. Set the DIP switch No.1 and 3 ON and supply the power to the EBA unit.
2. Set the DIP switch No.1 OFF to start the test.
3. Insert a bill to the bill insertion slot and then the VEND1 => VEND4 => ABN => STKF LED of the VM-450 will light.



Sensor Name	LED turned ON
Upper LVL	AVN
Upper PT-WL	VEND2
Lower LE-WL	VEND2
Upper RF-UP	VEND1
Lower RF-DF	VEND1
Upper LVB	VEND4
Upper LVR	STKF
Upper PT-WR	VEND3
Lower LE-WR	VEND3

5-3-5. Acceptor I/F Test (OUT)

This test allows you to confirm the operation of the output signal line from the acceptor to the external device (controller) according to the lighting sequence of the VM-450 LEDs.

1. Set the DIP switch No.1, 2, 3 and 4 ON and supply the power to the EBA unit.
 2. Set the DIP switch No.1 OFF to start the test. If the signals line from the acceptor to the external device properly, the VM-450 LEDs repeats to light as shown below.
- VEND 1 => VEND 2 => VEND 3 => VEND 4 => ABN => STKF => VEND 1...

5-3-6. Acceptor I/F Test (IN)

This test allows you to confirm the operation of the input signal line from the external device (controller) to the acceptor according to the lighting sequence of the VM-450 LEDs. Before performing this test, perform the 5-3-5 Acceptor I/F Test (Out).

1. Set the DIP switch No.1, and 4 ON and supply the power ON.
2. Set the DIP switch No.1 OFF and turn ON the ENABLE/DISABLE, REJ and ACK switches of the VM-450.
3. If the VEND2, VNED3 and VEND4 LEDs of the VM-450 lights, the signal line from the external device to the acceptor is no problem.

5-3-7. Bill Acceptance Test

This test allows you to confirm the bill acceptance.

1. Set the SW1 and 5 ON and supply the power to the EBA unit.
2. Set the SW1 OFF and then insert a bill to the bill insertion slot of the EBA unit.
3. If the bill is not accepted or rejected , the following error may occure.

# of Flashes (Slowly)	Diagnostic Description
4	Bill remains inside the acceptor.
5	Acceptor Feed Motor Speed Error.
6	(1) Acceptor motor was started but does not rotate. (2) Acceptor motor was stopped but does not stop. (3) No signal is sent from the acceptor encoder sensor.
9	(1) PB unit motor was started but does not rotate (2) PB unit motor was stopped but does not stop. (3) No signal is sent from the home sensor of the PB unit.
12	Sensor turned on at a timing impossible in normal operation.
# of Flashes (Rapidly)	Diagnostic Description
1	Bill was inserted at a crooked angle.
2	Magnetic sensor pattern error
3	Bill stays in the acceptor feed route.
4	Photo sensor error 1.
5	Bill feed error.
6	Judgment error.
7	Photo sensor error 2.
8	Photo sensor error 3.
9	Receiving inhibited bill was rejected.
10	Reject signal was input.
11	Lever Sensor has detected an error.
12	Back Sensor has detected an error.
13	Incorrect length bill.
14	Photo Sensor error 4.
15	Photo Sensor error 5.



- Do not use the bills like the ones below to confirm the bill acceptance. If you insert such a bill, it will not be identified properly.
 - a) Bills that are dirty, worm, wet, torn and badly wrinkled.
 - b) Bills with folded and overlapped corners or edges.
 - c) Bills that have considerably different cutting dimensions and printing displacement.
 - d) Bills that are stained or have iron particles on them.

5-3-8. PB Test

This test allows you to confirm the operation of the PB and PB lever sensor.

1. Set the DIP switches 1, 2, 3 and 5 ON and supply the power to the EBA unit.
2. Set the DIP switch No.1 OFF to start the test.
3. PB unit operates periodically. If the PB lever sensor is home position, VEND1 LED of VM-450 turns ON.

5-3-9. PB Feed Test

This test allows you to confirm the operation of the stacker feed, FEED1/FEED2 sensors and stacker reset switch.

1. Set the DIP switches No.1, 4 and 5 ON and supply the power to the EBA unit.
2. Set the DIP switch No. 1 OFF the PB unit operates periodically.
3. The following operation matters are to be confirmed and the LEDs of the VM-450 turn ON.

Operation	LED turned ON
PB Feed Forward Rotation is nomal.	ENABLE
PB Feed Rverce Rotation is normal.	DISABLED
Stacker Reset Switch is normal.	ABN
FEED 1 Sensor detects a bill.	VEND1
FEED2 Sensordetects a bill.	VEND1

5-3-10. PB Motor Speed/PB Feed Motor Speed Test

This test allows you to confirm the operation of the PB Motor speed and PB Feed Motor Speed.

1. Set the DIP switches No.1, 3, 4 and 5 ON and then supply the power to the EBA unit.
2. Set the switch No.1 OFF to start the test.
3. Insert a bill to confirm the PB Feed Motor speed, ON/OFF of the FEED1 and FEED2 sensor and feed load detection circuit.
4. Take out the bill and press the ACK switch of the VM-450.

Operation	LED turned ON
FEED 1 Sensor detects a bill.	VEND1
FEED2 Sensor detects a bill.	VEND2
PB Feed Motor Speed is normal.	VEND3
PB Feed Load Detection is normal.	VEND4
Loading Operation	ACK

5-3-11. Acceptor DIP Switch Test

This test allows you to confirm the operation of the EBA unit's DIP Switch

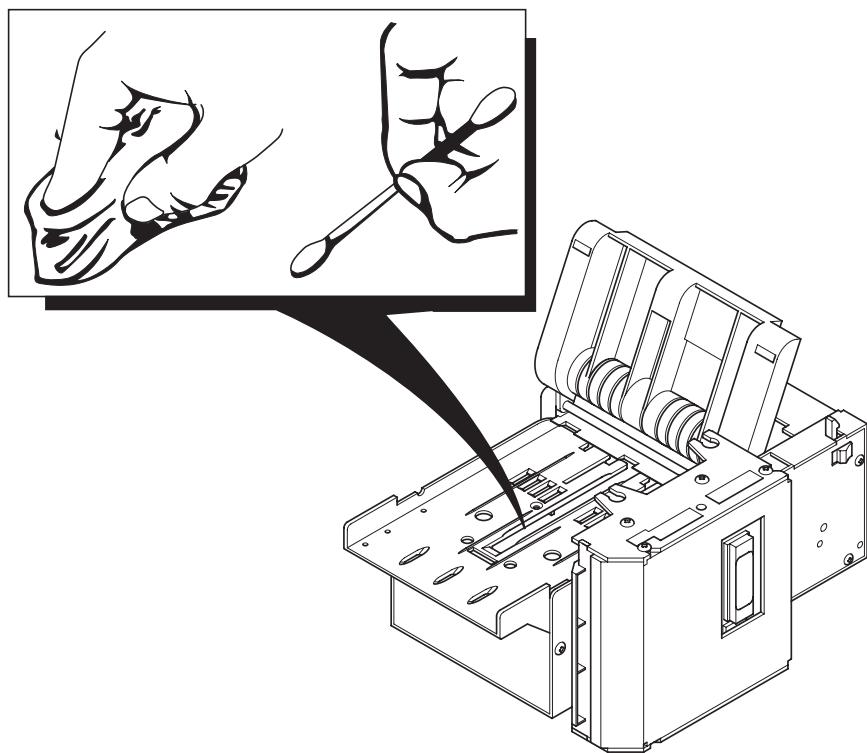
1. Set all DIP Switches ON and supply the power to the EBA unit.
2. Set the switch No.1 OFF and set the ENABLE switch of VM-450 ON. If the VEND1, VEND2, VEND3 LED of VM-450 turns ON, the switches No.2, 3 and 4 is normal.
3. Set the DISABLE switch of VM-450 ON. If the VEND1, VEND2, VEND3 and VEND4 LED of VM-450 turns ON, the switches No.5, 6, 7 and 8 is normal.

5-4. Cleaning

If the paper dust or foreign object spotted in the acceptor parts, the acceptance rate may go down. Clean the acceptor parts once a month. Wipe out on the sensor with lint-free cloth or cotton bud. Remove the paper dust or foreign object completely on the belts.



- **Do not use the organic solvent such as thinner or benzin, when wiping the EBA-2X-PBX unit.**



5-5. Maintenance Tool List

When maintenance or adjust EBA-2X-PBX unit, the following parts need to be purchased.

Items	EDP#	Part#	Description
Power Supply Unit	059307	VM-450	This unit is a unit to supply the power to EBA-2X-PBX unit and to use when performing the diagnostic.
Harness	059310	414-05-19	This harness is to connect with EBA-2X-PBX unit ant Power Supply Unit VM-450.
Serial Connector Harness	059301	IFU-001	This harness is to connect with PC and EBA-2X-PBX unit when adjusting.
MAG Tool	041793	MG-03	This is a MAG tool to use when adjusting EBA-2X-PBX unit.
White Reference Paper	059300	KS-034	This is a reference paper to adjust EBA-2X-PBX unit.
Black Reference Paper	059299	KS-035	This is a reference paper to adjust EBA-2X-PBX unit.

5-6. Support

Please contact to your nearest address as shown below, if you find any problems and errors on your TAIKO units. When you do so, please write down the problem and the symptom beforehand and then contact JCM.

■ Japan

Japan Cash Machine Co. Ltd. (Headquarters)

No. 3-15, 2 Chome
Nishiwaki, Hirano-ku, Osaka 547-0035
Japan
Phone: +81-66-703-8406 **Fax:** +81-66-704-7843
URL: www.jcm-hq.co.jp

■ Americas, Oceania

JCM American Corporation

925 Pilot Road, Las Vegas, NV 89119
U.S.A.
Phone: +1-702-651-0000 **Fax:** +1-702-644-5512
e-mail: customerservice@jcm-american.com **URL:** www.jcmamerican.com

■ Europe, Russia, Middle East, Africa

Japan Cash Machine Germany GmbH

Mündelheimer Weg 60
D-40472 Düsseldorf
Germany
Phone: +49-211-530645-60 **Fax:** +49-211-530645-85
e-mail: support@jcm-germany.com **URL:** www.jcm-germany.com

■ UK, Ireland

JCM United Kingdom Ltd.

Unit B, Third Avenue, Denbigh West Business Park
Bletchley, Milton Keynes, Buckinghamshire MK1 1EJ,
UK
Phone: +44-870-770-2863 **Fax:** +44-190-837-7834
e-mail: info@jcm-uk.com **URL:** www.jcm-uk.com

■ Asia

JCM Gold (HK) Ltd.

Unit 1-7, 3/F., Favor Industrial Centre
2-6 Kin Hong Street, Kwai Chung, N.T.
Hong Kong
Phone: +852-2429-7187 **Fax:** +852-2929-7003
e-mail: cs@jcmgold.com.hk **URL:** www.jcmgold.com.hk

NOTE

Chapter 6

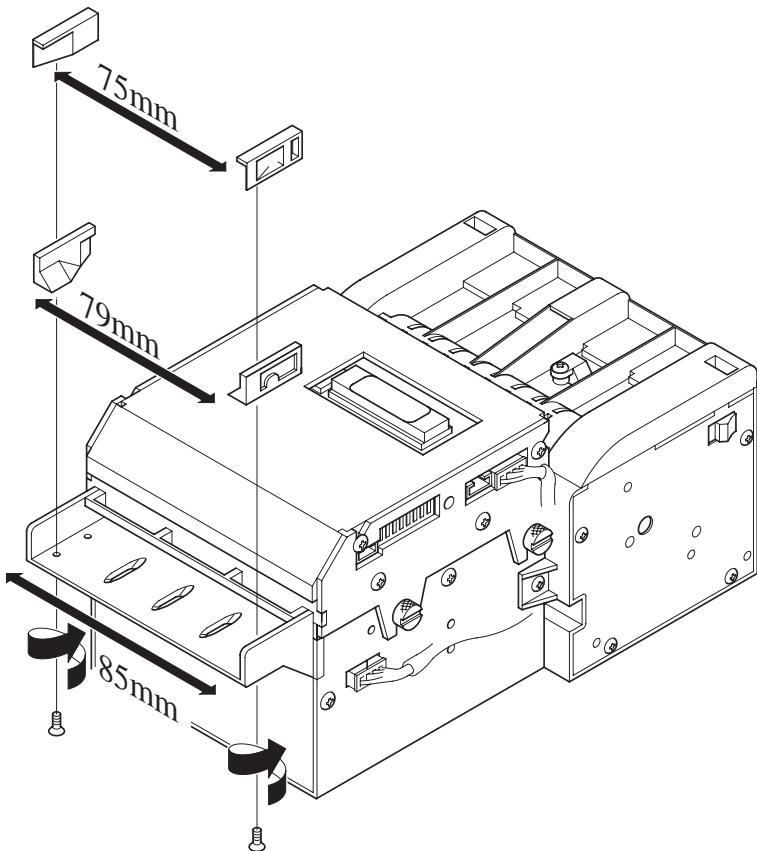
Replacement Procedure

- 6-1. Replacement of Faceplate Guide
- 6-2. Replacement of CPU Board/
Mother Head Board
- 6-3. Replacement of Motor Unit/
LED Board
- 6-4. Replacement of PB Board
- 6-5. Replacement of Motor/Sensor Board/
Belt

6-1. Replacement of Faceplate Guide

When replacing the Faceplate Guide, follow the instructions below.

1. Remove two (2) screws from beneath the faceplate
2. Change the Faceplate Guide of the both sides of the faceplate.
3. Tighten two (2) screws to hold the Faceplate Guide.

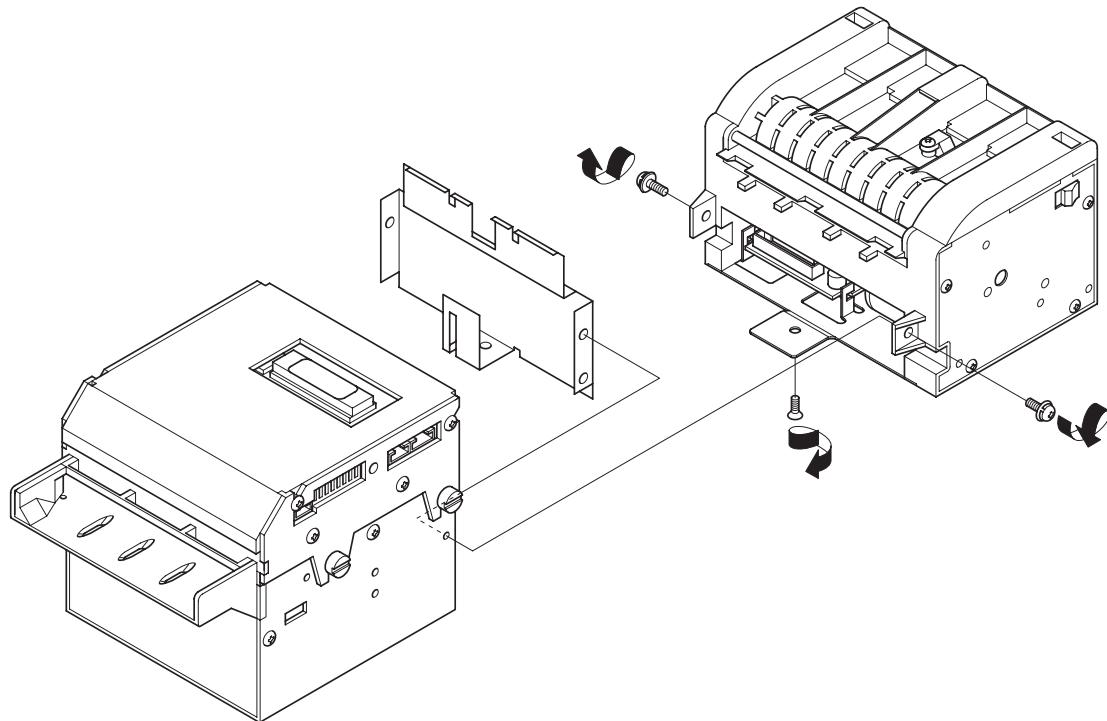


- Tightening the screw with too much force can damage the faceplate.

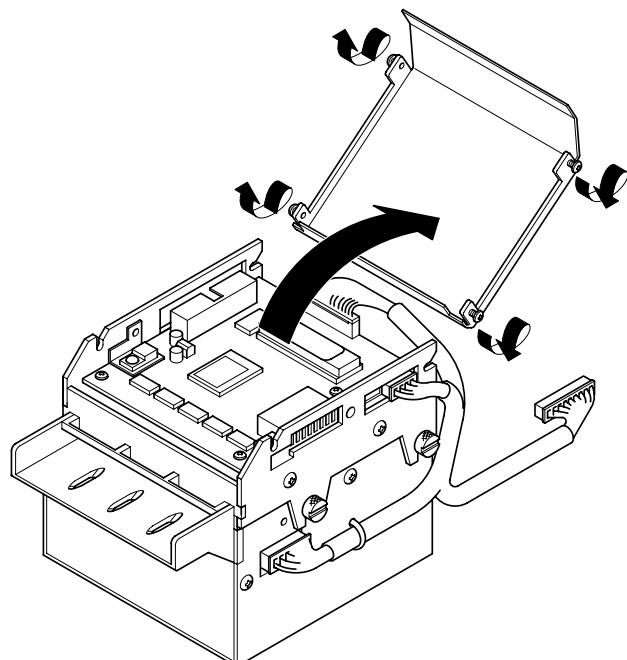
6-2. Replacement of CPU Board/Mother Head Board

When replacing the CPU Board, follow the instructions below.

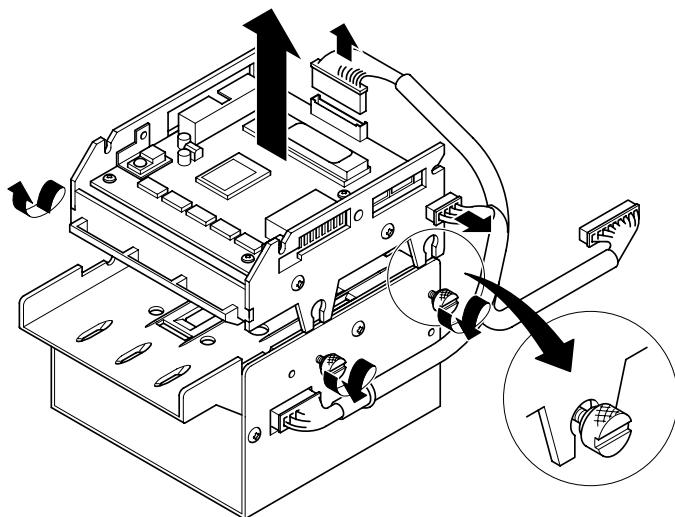
1. Remove three (3) screws to detach the acceptor from the PB unit.



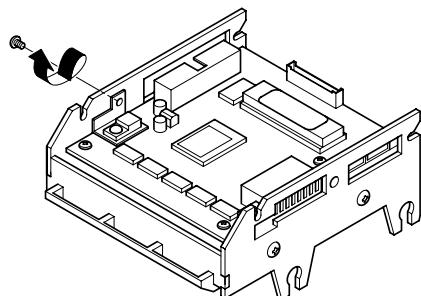
2. Remove two (2) screws on the both side of the unit to remove the top cover



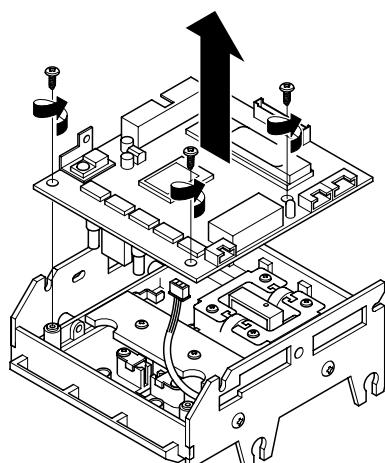
3. Remove two (2) connectors and loosen two (2) knobs each on the both side of the unit until the retaining boss comes out. Then, lift the upper scanning unit to detache it.



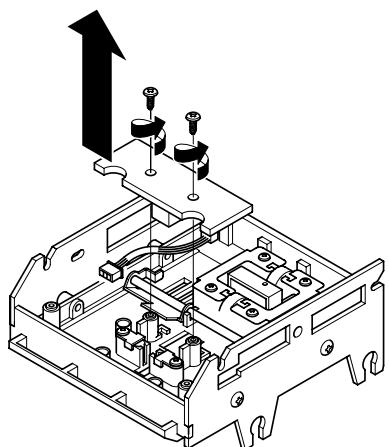
4. Remove a (1) screw on the left side panel.



5. Remove three (3) screws and disconnect the connector to detach the CPB board.



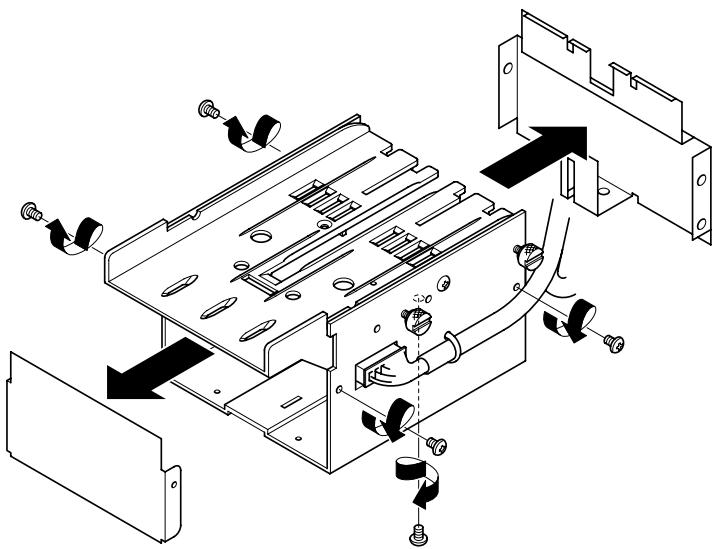
6. Remove two (2) screws to detach the Mother Head board.



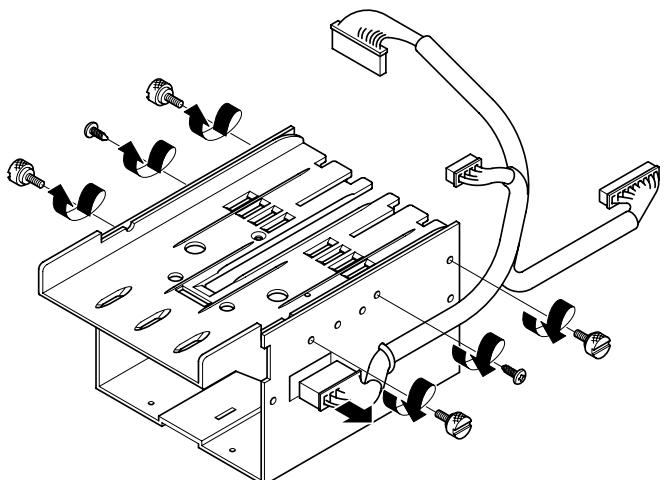
6-3. Replacement of Motor Unit/LED Board

When replacing the motor unit and LED Board, follow the instructions below.

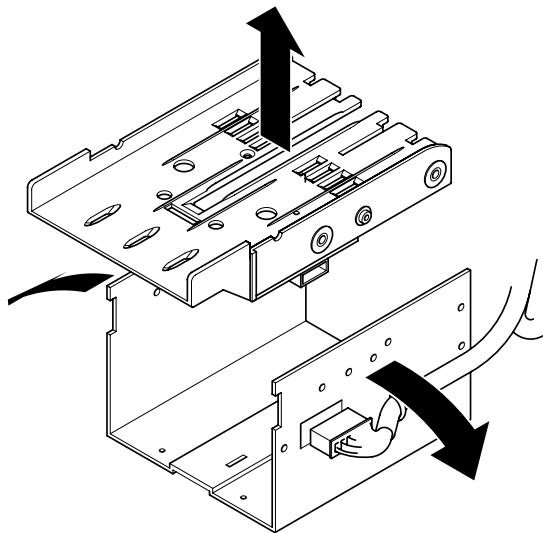
1. Remove a (1) screw each on the both side of the unit to remove the front cover. Then, remove a (1) screw each on either side and a (1) screw on the bottom plate to remove the rear cover.



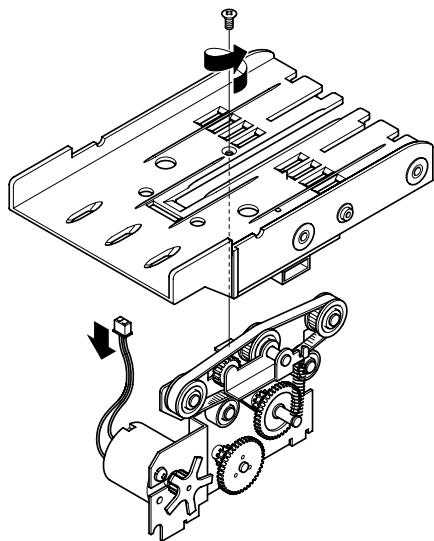
2. Remove four (4) knobs and two (2) screws on both sides and disconnect the connector.



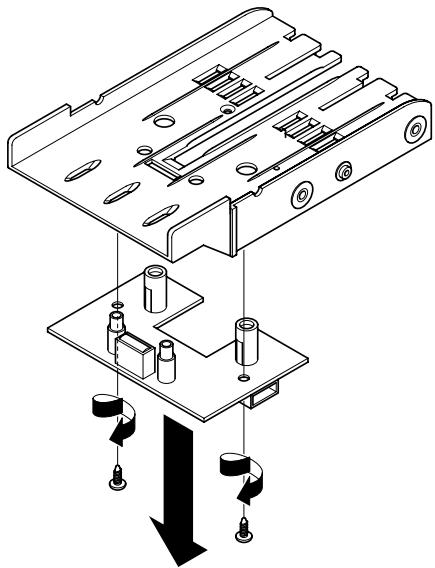
3. Push the side panels of the housing slightly outward, and lift up the assembly to remove it.



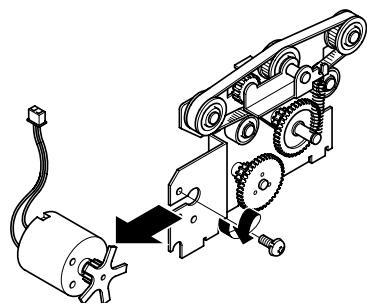
4. Remove a (1) screw on the top and disconnect the connector to remove the motor assembly.



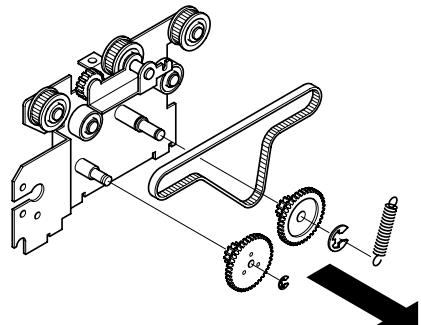
5. Remove two (2) screws to detach the LED board.



6. Remove a (1) screw to remove the motor.



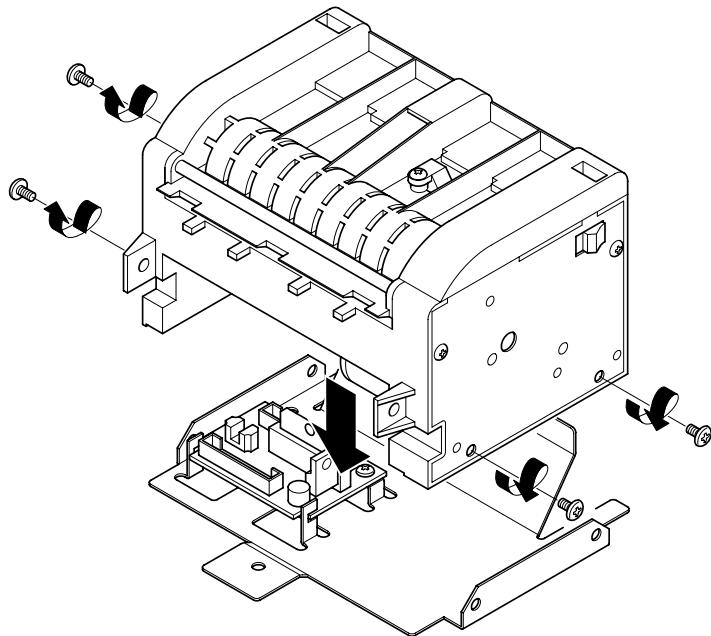
7. Remove a (1) spring, two (2) E-rings and two (2) gears to remove a belt.



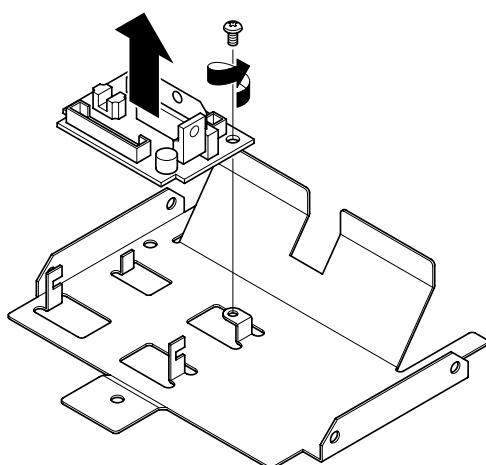
6-4. Replacement of PB Board

When replacing the PB Board and Motor Unit, follow the instructions below.

1. Remove two (2) screws each on the either side to remove the bottom plate.



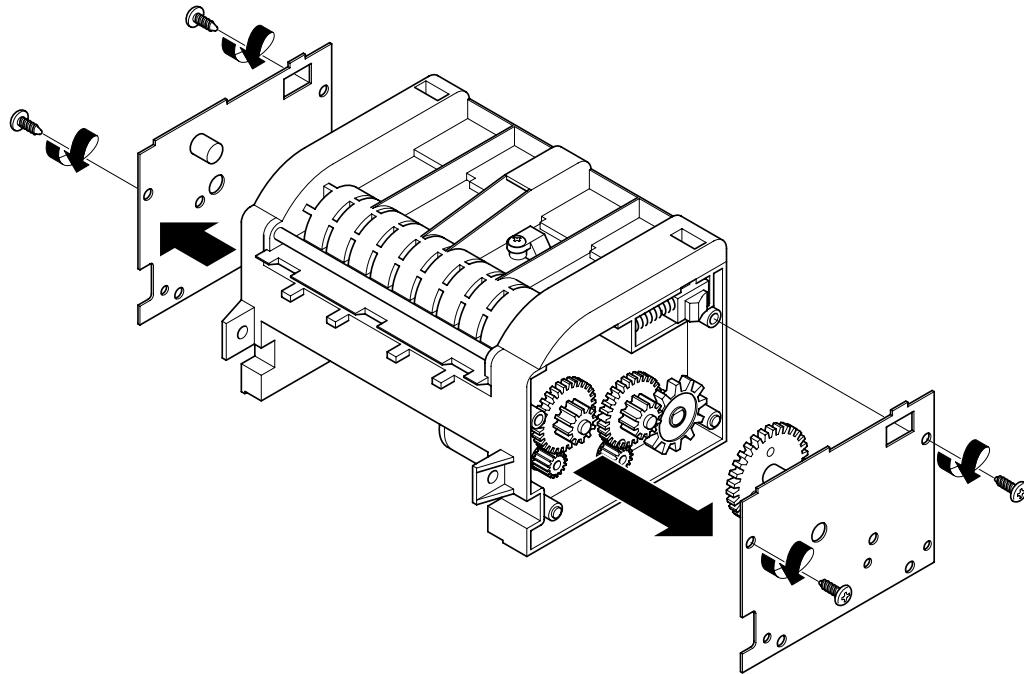
2. Remove a (1) screw to detach the board.



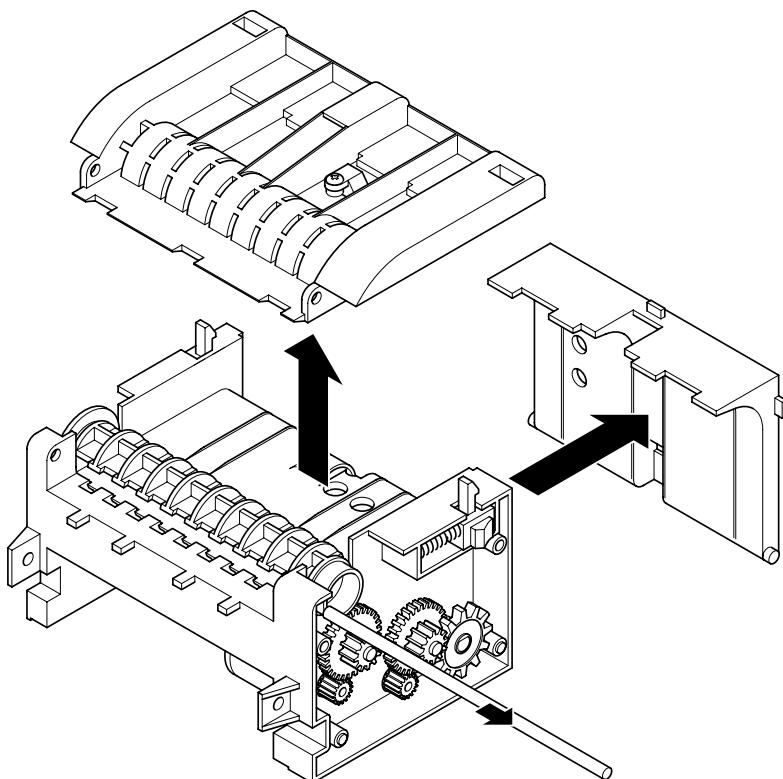
6-5. Replacement of Motor/Sensor Board/Belt

When replacing the Entrance and Exit Solenoid, follow the instructions below.

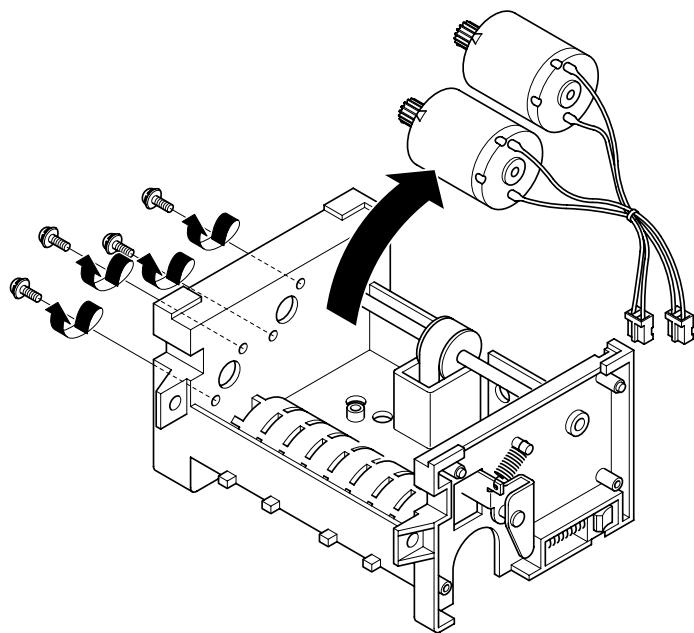
1. Remove 2 screws each out on either side to remove both side pannels.



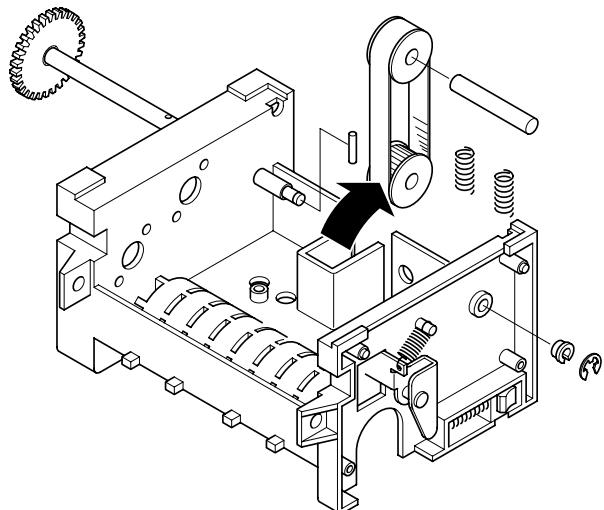
2. Remove the rear guide and pull out the shaft to remove the top cover.



3. Remove four (4) screws to remove two (2) motors.



4. Remove two (2) screws to detach the sensor boards.



5. Remove a (1) E-ring and bearing and then pull out the shaft from the opposite side to remove the pulley, belt, spring, another shaft and pin.

